SUPER®

# SUPER® X8DAH+
# SUPER® X8DAH+-F

# USER'S MANUAL

Revision 1.0c

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Manual Revision 1.0c

Release Date: April 26, 2010

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# Preface

## About this Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPER® X8DAH+/ X8DAH+-F motherboard.

## About this Motherboard

The SUPER® X8DAH+/X8DAH+-F supports the Intel® 5500/5600 Series Processor platform, the first dual-processing platform that supports the Intel QuickPath Interconnect (QPI) Technology, providing the next generation point-to-point system interface to replace the current Front Side Bus. With the Intel 5520 chipset built in, the X8DAH+/X8DAH+-F substantially enhances system performance with increased bandwidth and unprecedented scalability optimized for HPC/Cluster systems and intensive applications. Please refer to our website (http://www.supermicro.com/products/) for updates on supported processors. This product is intended to be installed and serviced by professional technicians.

## Manual Organization

**Chapter 1** describes the features, specifications and performance of the motherboard and provides detailed information about the chipset.

**Chapter 2** provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system. If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory and system setup stored in the CMOS.

**Chapter 4** includes an introduction to the BIOS and provides detailed information on running the CMOS Setup utility.

**Appendix A** lists BIOS POST Error Codes**. Appendix B** and **Appendix C** provide the Windows OS and Other Software Installation Instructions.

## Conventions Used in the Manual

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury to yourself.

**Danger/Caution:** Instructions to be strictly followed to prevent catastrophic system failure or to avoid bodily injury.

**Warning:** Important information given to ensure proper system installation or to prevent damage to the components.

**Note:** Additional Information given to differentiate various models or to ensure correct system setup.

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# Chapter 1

# Introduction

## 1-1 Overview

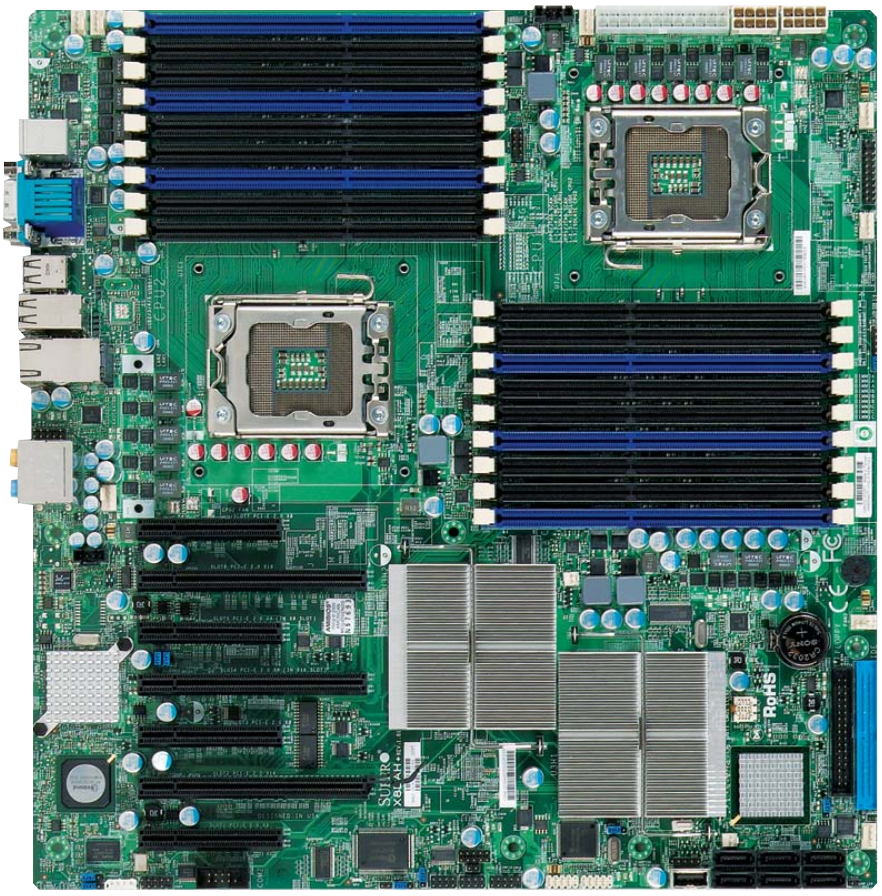
### Checklist

Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide the highest standards in quality and performance. Check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

The following items are included in the retail box.

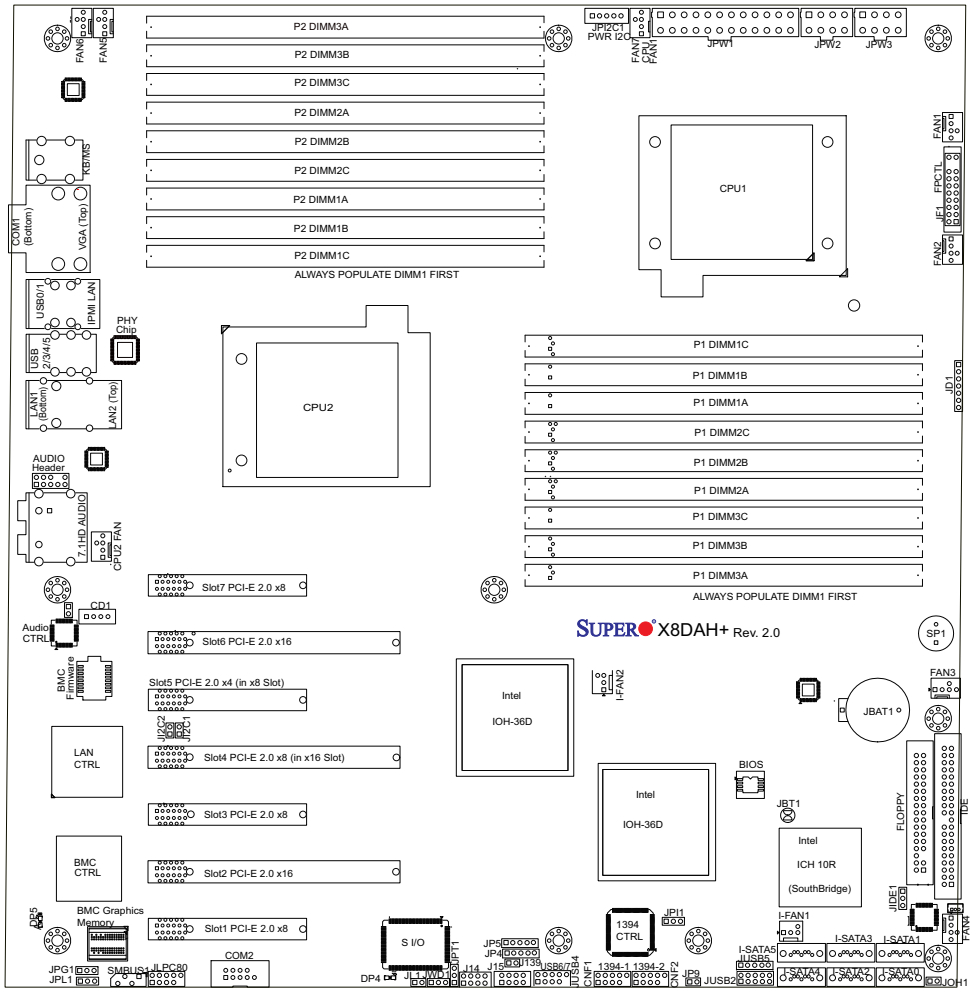
- One (1) Supermicro Mainboard
- One (1) floppy ribbon cable (CBL-022L)
- One (1) IDE ATA66 cable (CBL-036L-03)
- Six (6) Serial ATA cables (CBL-0044L)
- One I/O backpanel shield (MCP-260-00025-0N)
- One (1) Supermicro CD containing drivers and utilities
- One (1) User's/BIOS Manual

## SUPER® X8DAH+/X8DAH+-F Image



**Note:** The drawings and pictures shown in this manual were based on the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in the manual.

## SUPER® X8DAH+/X8DAH+-F Layout




### Differences between X8DAH+/X8DAH+-F

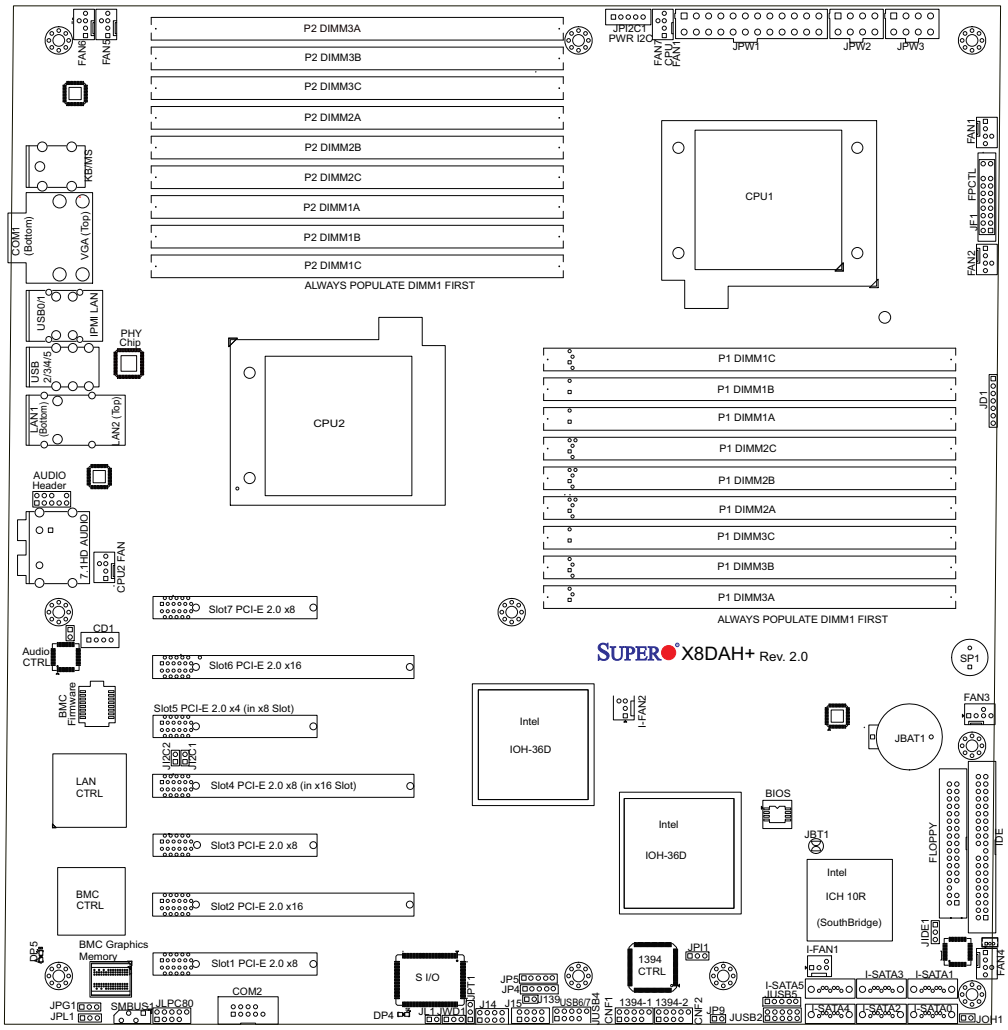
| | X8DAH+ | X8DAH+-F |
|---|---|---|
| **SATA (ICH10R)** | Yes | Yes |
| **IPMI 2.0 w/KVM** | No | Yes |
| **WPCM450 BMC** | No | Yes |
| **Dedicated LAN & PHY chip** | No | Yes |

**Notes:**

1. IPMI 2.0, WPCM450 BMC Controller, the PHY chip and Dedicated LAN port w/KVM support are available on the X8DAH+-F only. For more information, refer to the user guide posted on our website @ http://www.supermicro.com/support/manuals/.

2. The I-FAN 1 and I-FAN2 are available for a R. 2.0 or later version motherboard only.

## Quick Reference




### Notes

1. Jumpers not indicated are for test purposes only.
2. "■" indicates the location of Pin 1.
3. When DP4 is on, the onboard power connection is on. Make sure to unplug the power cables before removing or installing components.

**Warning**:

1. To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the two 8-pin (JPW2,JPW3) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

2. To prevent system overheating, be sure to provide adequate airflow to the system.

**X8DAH+/X8DAH+-F Quick Reference**

| Jumper | Description | Default Setting |
|---|---|---|
| JBT1 | CMOS Clear | Open (Normal) |
| JPIDE1 | Compact Flash Enabled | Pins 1-2 (Enabled) |
| JI²C1/JI²C2 | SMB to PCI/PCI-E Slots | Open/Open (Disabled) |
| JPG1 | VGA Enable | Pins 1-2 (Enabled) |
| JPI1 | 1394-1/1394 Enable | Pins 1-2 (Enabled) |
| JPL1 | LAN1/2 Enable | Pins 1-2 (Enabled) |
| JWD1 | Watch Dog | Pins 1-2 (Reset) |

| Connector | Description |
|---|---|
| CNF1/CNF2 | 1394a-1/-2 Ports |
| Audio Connections | BP 7.1 HD Audio, BP Audio Header, CD_In |
| COM1/COM2 | Backplane Serial Port/FP Serial Header |
| FAN 1-8 | System/CPU Fan Headers (Fans 7~8: CPU Fans 1/2) |
| I-FAN 1/2 | Fans 1/2 Headers for IOH Chips 1/2 |
| Floppy | Floppy Drive |
| IDE | IDE Drive |
| JD1 | PWR LED/Speaker Header (Pins 1~3: Power LED, Pins 6~7: Onboard Buzzer, Pins 4~7: External Speaker) |
| JF1 | Front Panel Connector |
| JL1 | Chassis Intrusion Header |
| JOH1 | Overheat LED Header |
| JPI²C | Power Supply SMBbus I²C Header |
| JPW1, JPW2/JPW3 | 24-pin ATX PWR, 8-pin Secondary PWR (See Warning on Page 1-4) |
| LAN1/2, Dedicated LAN | G-LAN (RJ45) Ports (Dedicated LAN: X8DAH+-F) |
| I-SATA0 ~ I-SATA5 | (Intel South Bridge) SATA Ports |
| SMBUS1 | System Management Bus Header |
| SP1 | Onboard Buzzer/Internal Speaker |
| USB 0/1, 2~5 | Backpanel Universal Serial Bus (USB) Ports 0/1, 2~5 |
| USB 6/7, 8, 9 | Front Panel (Accessible) USB Ports 6/7 (JUSB4), USB 8 (JUSB2), USB 9 (JUSB5) |
| VGA | VGA Connector |

| LED | Description |
|---|---|
| DP4 | Onboard Standby Power LED Indicator |
| DP5 | BMC Heartbeat LED Indicator (X8DAH+F only) |

## Motherboard Features

### CPU

- Two Intel® 5500/5600 Series (LGA 1366) processors. Each processor supports two full-width Intel QuickPath Interconnect (QPI) @6.4 GT/s with a total of up to 51.2 GB/s Data Transfer Rate (6.4 GB/s per direction) (See Note 2 on P. 1-3.)

### Memory

- 18 240-pin DIMM sockets support up to 192 GB of Reg. ECC or up to 48 GB of Unbuffered ECC/Non-ECC DDR3 1333/1066/800 MHz Memory modules (See Section 2-4 in Chapter 2 for DIMM Slot Population.) (See Note 2 on P. 1-3.)

### Chipset

- Intel 5520 chipset, including: two IOH-36D (I/O Hub)
- One ICH10R (South Bridge)

### Expansion Slots

- Three PCI-E 2.0 x8 slots (Slot 1/Slot 3/Slot7)
- Two PCI-E 2.0 x16 slots (Slot 2/Slot 6)
- One PCI-E 2.0 x4 (in x8) slots (Slot 5)
- One PCI-E 2.0 x8 (in x16) slots (Slot 4)

### BIOS

- 32 Mb AMI SPI Flash ROM
- PCI 2.2, ACPI 1.0/2.0/3.0, Plug and Play (PnP), DMI 2.3, USB Keyboard support, and SMBIOS 2.3

### PC Health Monitoring

- Onboard voltage monitors for CPU0 Vcore, CPU1 Vcore, 1.5V, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt
- Fan status monitor with firmware control
- CPU/chassis temperature monitors
- Platform Environment Control Interface (PECI) ready
- Thermal Monitor 2 (TM2) support
- CPU fan auto-off in sleep mode
- CPU slow-down on temperature overheat
- Pulse Width Modulation (PWM) Fan Control
- CPU thermal trip support for processor protection, power LED
- Power-up mode control for recovery from AC power loss
- Auto-switching voltage regulator for CPU cores
- System overheat/Fan Fail LED Indicator and control
- Chassis intrusion detection

- System resource alert via Supero Doctor III

### ACPI Features

- Slow blinking LED for suspend state indicator
- Main switch override mechanism
- ACPI Power Management
- Keyboard Wakeup from Soft-off

### Onboard I/O

- Intel ICH10R supports six SATA2 ports (with RAID0, RAID1, RAID10, RAID5 supported in the Windows OS Environment, and RAID0, RAID1, RAID10 for Linux Platforms) **(Note 1)**
- Intel 82576 Gigabit Ethernet controllers supports Giga-bit LAN1/2 ports
- A PHY chip supports the Dedicated IPMI LAN (X8DAH+-F only) **(Note 2)**
- One VGA Port supported by the Winbond WPCM 450R BMC Controller
- PS/2 mouse/keyboard ports, one COM port and one Serial header
- Up to ten USB 2.0 (Universal Serial Bus) (six Backpanel USB Ports, and four Front Panel/Front Accessible USB connections)
- Super I/O: Winbond W83627DHG
- ALC 8830 Audio Controller supports 7.1 HD Audio with Line-in, Line-out and Microphone, Backpanel Audio and CD connections
- Two Internal1394 headers
- One EIDE Ultra DMA/100 bus master interface supports UDMA Mode 5 and PIO Mode 4
- IPMI 2.0 with full KVM support (X8DAH+-F only) **(Note 2)**

### Other

- Console redirection
- Onboard Fan Speed Control by Thermal Management via BIOS

### CD/Diskette Utilities

- BIOS flash upgrade utility and device drivers

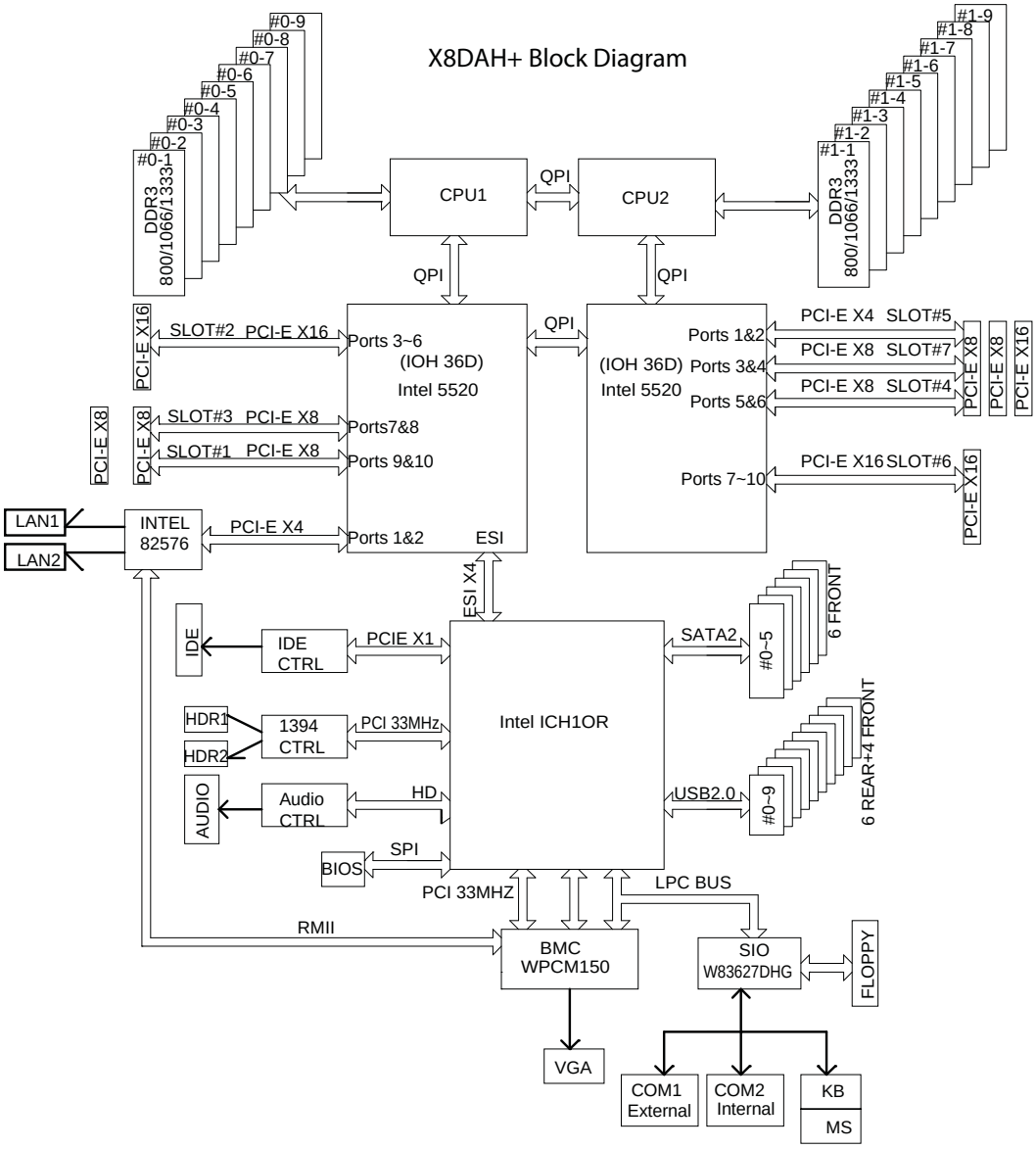
### Dimensions

- Ext. ATX 13.68" (L) x 13.00" (W) (347.47 mm x 330.20 mm)

**Note 1:** For more information on SATA HostRAID configuration, please refer to the Intel SATA HostRAID User's Guide posted on our website @ http://www.supermicro.com/support/manuals/.

**Note 2:** For more information on IPMI configuration, please refer to the Embedded IPMI User's Guide posted on our website @ http://www.supermicro.com/support/manuals/.

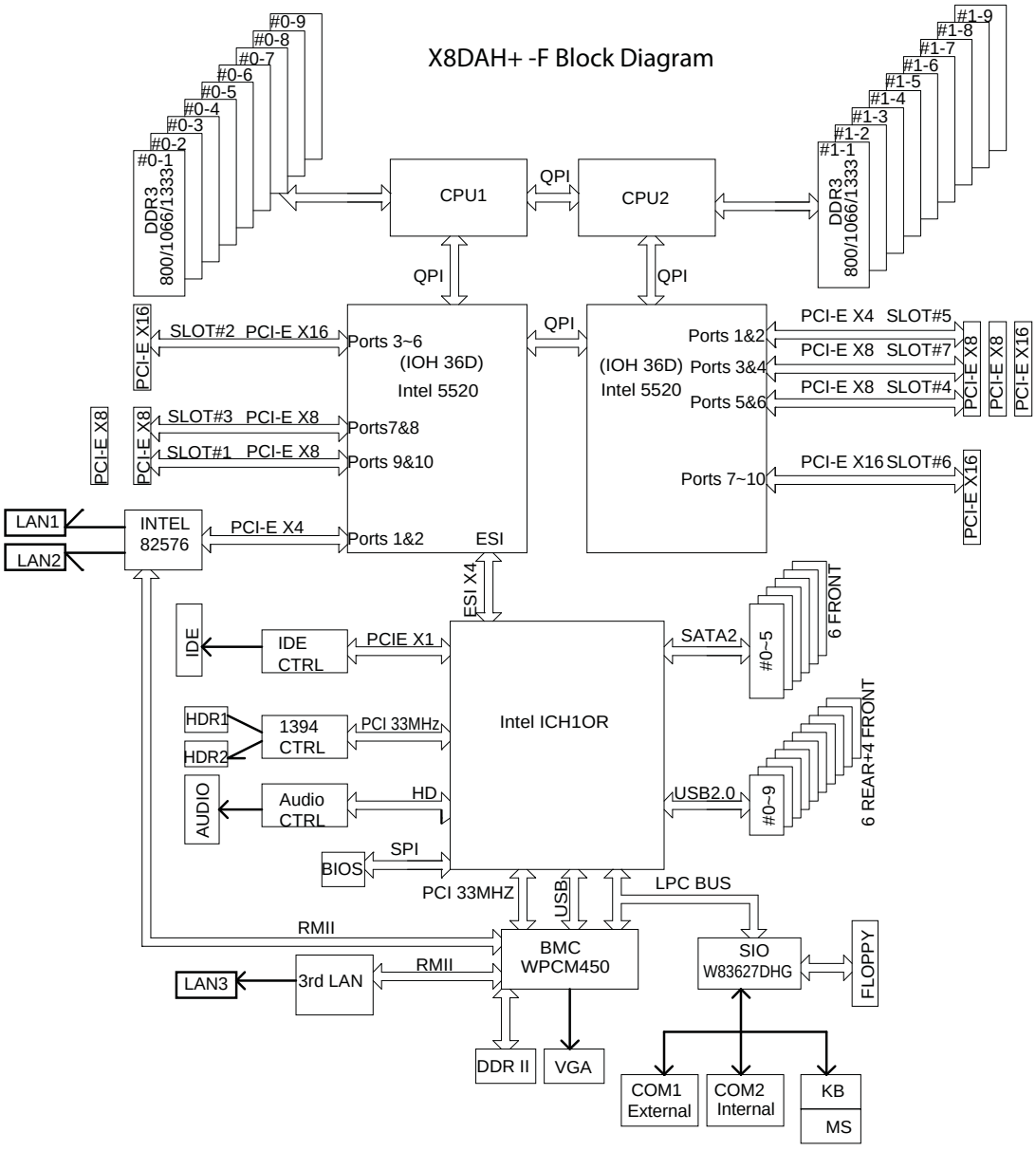
## X8DAH+ System Diagram




**Block Diagram for the X8DAH+**

**Note:** This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of each motherboard.

## X8DAH+-F System Diagram




**Block Diagram for the X8DAH+-F**

**Note:** This is a general block diagram. Please see the previous Motherboard Features pages for details on the features of each motherboard.

## 1-2 Chipset Overview

Built upon the functionality and the capability of the 5500/5600 Series Processor platform, the X8DAH+/X8DAH+-F motherboard provides the performance and feature set required for dual-processor/IOH-based high-end systems optimized for High Performance Computing (HPC)/Cluster platforms. The 5520 chipset consists of the IOH 36D (I/O Hub), and the ICH10R (South Bridge). With the Intel QuickPath Interconnect (QPI) controller built in, the 5520 platform offers the next generation point-to-point system interconnect interface that replaces the current Front Side Bus Technology, substantially enhancing system performance and scalability.

The IOH-36D connects to each processor through an independent QPI link. Each link consists of 20 pairs of unidirectional differential lanes for transmission and receiving in addition to a differential forwarded clock. A full-width QPI link pair provides 84 signals.

The 5520 chipset supports up to 36 PCI Express Gen2 lanes, peer-to-peer read and write transactions. The ICH10R provides up to seven PCI-Express ports, six SATA ports and 10 USB connections.

In addition, the 5520 platform also offers a wide range of RAS (Reliability, Availability and Serviceability) features. These features include memory interface ECC, x4/x8 Single Device Data Correction (SDDC), Cyclic Redundancy Check (CRC), parity protection, out-of-band register access via SMBus, memory mirroring, memory sparing, and Hot-plug support on the PCI-Express Interface.

### Features of the 5500/5600 Processor and the 5520 Chipset

- Four processor cores in each processor with 8MB shared cache among cores
- Two full-width Intel QPI links, up to 6.4 GT/s of data transfer rate in each direction
- Virtualization Technology, Integrated Management Engine supported
- Point-to-point cache coherent interconnect, Fast/narrow unidirectional links, and Concurrent bi-directional traffic
- Error detection via CRC and Error correction via Link level retry

## 1-3 Special Features

### Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power- on state. See the Advanced BIOS Setup section to change this setting. The default setting is **Last State**.

## 1-4 PC Health Monitoring

This section describes the PC health monitoring features of the X8DAH+/X8DAH+-F. All have an onboard System Hardware Monitor chip that supports PC health monitoring. An onboard voltage monitor will scan these onboard voltages continuously: CPU0 Vcore, CPU1 Vcore, 1.5V, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

### Fan Status Monitor with Firmware Control

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management via BIOS (under Hardware Monitoring in the Advanced Setting).

### Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

**Note:** To prevent system overheating, be sure to provide adequate airflow to the system.

### CPU Fan Auto-Off in Sleep Mode

The CPU fan becomes active when the power is turned on. It continues to operate when the system enters the Standby mode. When in the sleep mode, the CPU will not run at full power, thereby generating less heat.

### System Resource Alert

This feature is available when used with Supero Doctor III in the Windows OS environment or used with Supero Doctor II in Linux. Supero Doctor is used to notify the user of certain system events. For example, you can also configure Supero Doctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond a pre-defined range.

## 1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 2000 and Windows 2003 Operating Systems.

### Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

### Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Pressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system "alive." In case the system malfunctions and you want to turn off the power, just press and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

## 1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The X8DAH+/X8DAH+-F can accommodate 24-pin ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. In addition, the two 12V 8-pin power connections are also required to ensure adequate power supply to the system. Also your power supply must supply 1.5A for the Ethernet ports.

**Warning**: To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the two 8-pin (JPW2, JPW3) power connectors on the motherboard for adequate power supply to your system. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (For more information, please refer to the website at http://www.ssiforum.org/). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

## 1-7 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s. It also provides two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power manage-

ment through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

## 1-8 Overview of the Winbond WPCM450 Controller (For X8DAH+-F Only)

The Winbond WPCM450 Controller is a Baseboard Management Controller (BMC) that supports the 2D/VGA-compatible Graphics Core with the PCI interface, Virtual Media, and Keyboard/Video/Mouse Redirection (KVMR) modules. With blade-oriented Super I/O capability built-in, the WPCM450 Controller is ideal for legacy-reduced server platforms.

The WPCM450 interfaces with the host system via a PCI interface to communicate with the Graphics core. It supports USB 2.0 and 1.1 for remote keyboard/mouse/virtual media emulation. It also provides LPC interface to control Super IO functions. The WPCM450 is connected to the network via an external Ethernet PHY module.

The WPCM450 communicates with onboard components via six SMBus interfaces, fan control, and Platform Environment Control Interface (PECI) buses.

# Chapter 2

# Installation

## 2-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

### Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

## 2-2 Motherboard Installation

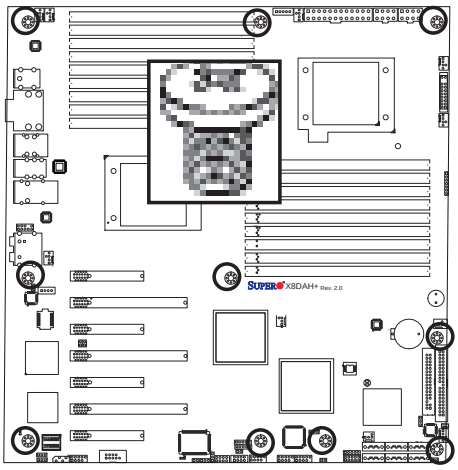
All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both motherboard and chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray. **Note**: Some components are very close to the mounting holes. Please take precautionary measures to prevent damage to these components when installing the motherboard to the chassis.

### Tools Needed

1. Phillips Screwdriver

2. Pan head #6 screws

**Locations of Mounting Holes**



### Installation Instructions

1. Install the IO shield into the chassis.
2. Locate the mounting holes on the motherboard. Refer to the layout above for mounting hole locations.
3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.
4. Install standoffs in the chassis as needed.
5. Install the motherboard into the chassis carefully to avoid damage to motherboard components.

**Warning**: To avoid damaging the motherboard and its components, please do not apply any force greater than 8 *lb/sq.in* (8 lbs. per square inch) when installing a screw into a mounting hole.

6. Insert a Pan head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis, using a Phillips screwdriver.
7. Repeat Step 4 to insert #6 screws to all mounting holes.
8. Make sure that the motherboard is securely placed on the chassis.

## 2-3 Processor and Heatsink Installation

When handling the processor package, avoid placing direct pressure on the label area of the fan.

**Notes:**

1. Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

2. Make sure to install the motherboard into the chassis before you install the CPU heatsink and heatsink fans.

3. When purchasing a motherboard without a 5500/5600 Series processor pre-installed, make sure that the CPU socket plastic cap is in place, and none of the CPU socket pins are bent; otherwise, contact the retailer immediately.

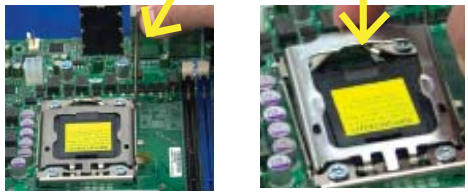
4. Refer to the MB Features Section for more details on CPU support.

### Installing an LGA 1366 Processor

1. Press the socket clip to release the load plate, which covers the CPU socket, from its locking position.

2. Gently lift the socket clip to open the load plate.

3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.



4. After removing the plastic cap, using your thumb and the index finger, hold the CPU at the north and south center edges.

5. Align the CPU key, the semi-circle cutout, against the socket key, the notch below the gold color dot on the side of the socket.

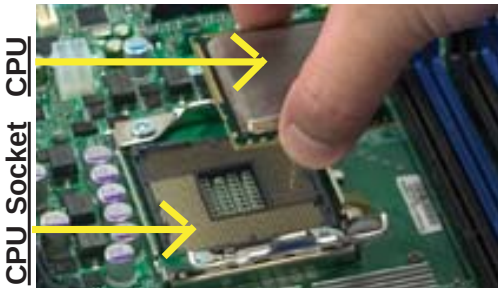
6. Once both the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. (Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.)

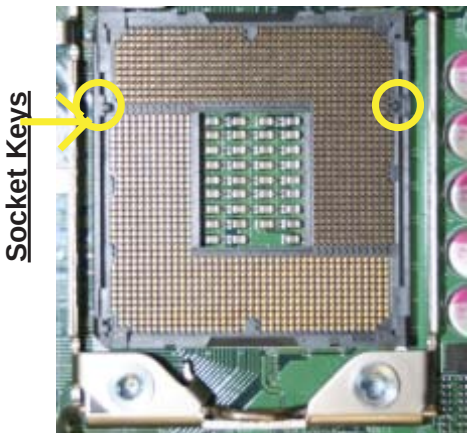
7. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

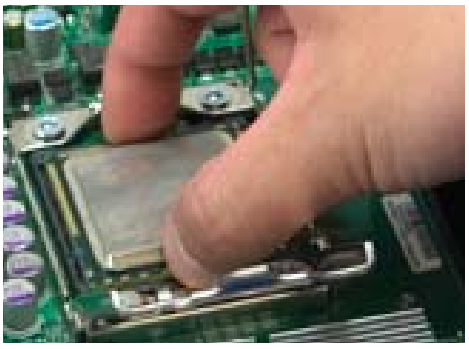
8. Once the CPU is securely seated on the socket, lower the CPU load plate to the socket.

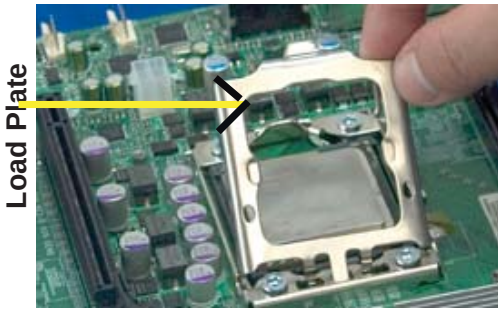
9. Use your thumb to gently push the socket clip down to the clip lock.

**Warning**: Please save the plastic cap. The motherboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed will cause damage to the socket pins.



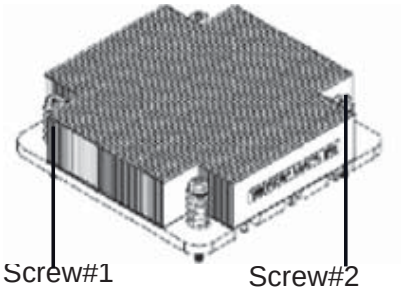





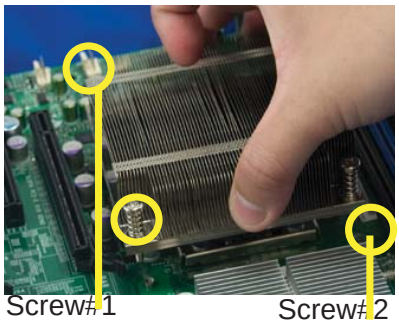


## Installing a CPU Heatsink

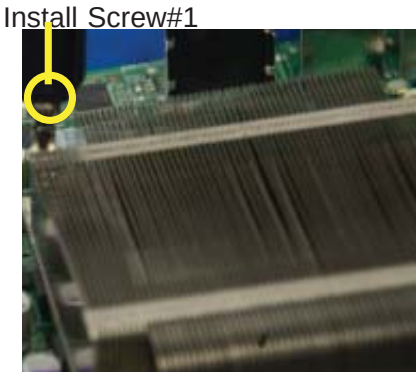
1. Do not apply any thermal grease to the heatsink or the CPU die because the required amount has already been applied.



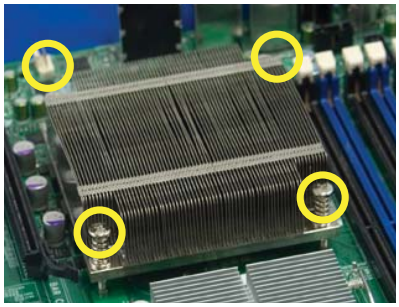

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.




3. Install two diagonal screws (ie the #1 and the #2 screws) and tighten them until just snug (-do not fully tighten the screws to avoid possible damage to the CPU.)



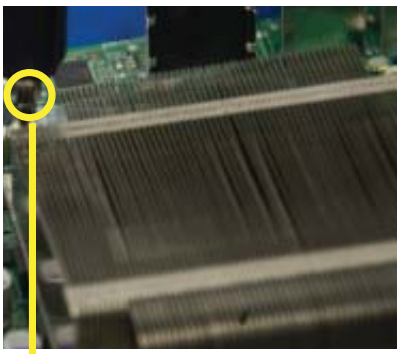

4. Finish the installation by fully tightening all four screws.



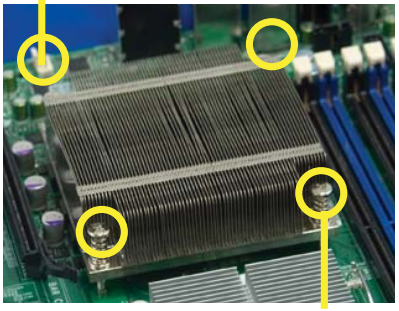
### *Removing the Heatsink*

**Warning:** We do not recommend that the CPU or the heatsink be removed. However, if you do need to remove the heatsink, please follow the instructions below to uninstall the heatsink and prevent damage to the CPU or other components.

1. Unplug the power cord from the power supply.
2. Disconnect the heatsink fan wires from the CPU fan header.
3. Using a screwdriver, loosen and remove the heatsink screws from the motherboard in the sequence as show in the picture on the right.
4. Hold the heatsink as shown in the picture on the right and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink.)
5. Once the heatsink is loosened, remove it from the CPU socket.
6. To reinstall the CPU and the heatsink, clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before reinstalling them on the motherboard.



Using a screwdriver to remove Screw#1



Remove Screw#2

## 2-4 Memory Installation

**Note**: Check the Supermicro website for recommended memory modules.

***CAUTION***

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (See step 1).

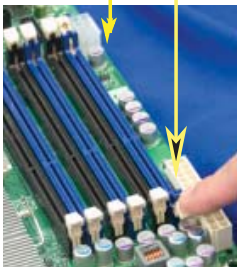
### DIMM Installation

1. Insert the desired number of DIMMs into the memory slots, starting with DIMM #P1-DIMM1A. When populating DIMM modules always start with Channel1 (#P1-DIMM1A, 1B and 1C) first. For optimal memory performance, please use memory modules of the same type and the same speed on the motherboard. (See the Memory Installation Table.)

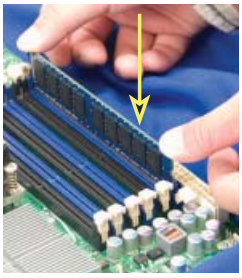
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.

3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

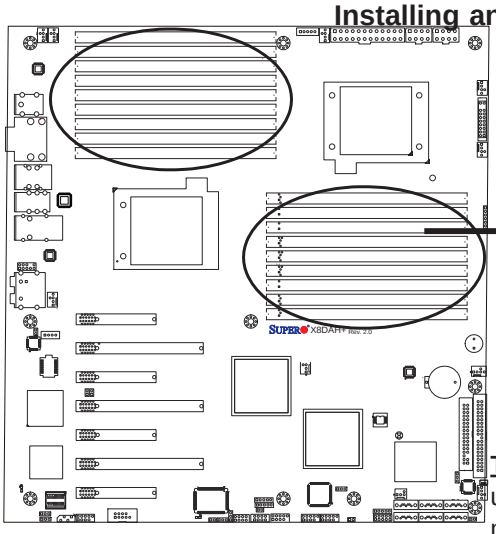
**Press down the release tabs**

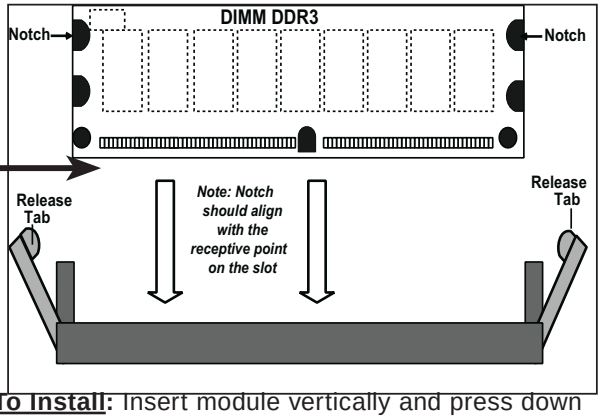


**Insert & press down a DIMM module into the slot**



### Installing and Removing DIMMs

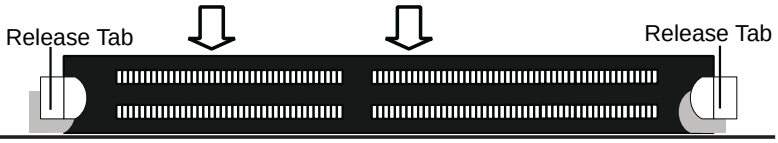





**To Install:** Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

**To Remove:**
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.

**Top View of DDR3 Slot**



### *Memory Support*

The X8DAH+/X8DAH+-F supports up to 192 GB Registered ECC or up to 48GB Unbuffered ECC/Non-ECC DDR3 1333 MHz/1066 MHz/800 MHz in 18 DIMMs.

**Note:** Memory Speed support depends on the type(s) of CPU(s) used.

### *DIMM Module Population Configuration*

For memory to work properly, follow the tables below for memory installation:

**Memory Population for Optimal Performance -For a Motherboard with One CPU (CPU1) Installed**

| **P1-DIMMs** | **To Populate P1-DIMMs** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Branch 0** | | | **Branch 1** | | | **Branch 2** | | |
| 3 DIMMs | P1-1A | | | P1-2A | | | P1-3A | | |
| 6 DIMMs | P1-1A | P1-1B | | P1-2A | P1-2B | | P1-3A | P1-3B | |
| 9 DIMMs (RDIMMs only) (**Note**) | P1-1A | P1-1B | P1-1C | P1-2A | P1-2B | P1-2C | P1-3A | P1-3B | P1-3C |

**Note**: Max. of 6 UDIMM modules are supported by a CPU.

**Memory Population for Optimal Performance -For a Motherboard with One CPU (CPU2) Installed**

| **P2-DIMMs** | **To Populate P2-DIMMs** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Branch 0** | | | **Branch 1** | | | **Branch 2** | | |
| 3 DIMMs | P2-1A | | | P2-2A | | | P2-3A | | |
| 6 DIMMs | P2-1A | P2-1B | | P2-2A | P2-2B | | P2-3A | P2-3B | |
| 9 DIMMs (RDIMMs only (**Note**) | P2-1A | P2-1B | P2-1C | P2-2A | P2-2B | P2-2C | P2-3A | P2-3B | P2-3C |

**Note**: Max. of 6 UDIMM modules are supported by a CPU.

**Memory Population for Optimal Performance -For a Motherboard with Two CPUs Installed**

| | **CPU 1 (To Populate P1-DIMMs)** | | | **CPU 2 (To Populate P2-DIMMs)** | | |
|---|---|---|---|---|---|---|
| | **Branch 0** | **Branch 1** | **Branch 2** | **Branch 0** | **Branch 1** | **Branch 2** |
| 6 DIMMs | P1-1A | P1-2A | P1-3A | P2-1A | P2-2A | P2-3A |
| 12 DIMMs | P1-1A/1B | P1-2A/2B | P1-3A/3B | P2-1A/1B | P2-2A/2B | P2-3A/3B |
| 18 DIMMs (For RDIMMs only) **(Note)** | P1-1A/1B/1C | P1-2A/2B/2C | P1-3A/3B/3C | P2-1A/1B/1C | P2-2A/2B/2C | P2-3A/3B/3C |

**Note**: Max. of 6 UDIMM modules are supported by a CPU.

### *Memory Support for the Motherboard with the 5500 Processor(s) Installed*

| RDIMM Population for the Motherboard w/5500 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Reg.= Registered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Reg. DDR3 ECC | 800,1066,1333 | SR or DR |
| 3 | 1 | Reg. DDR3 ECC | 800,1066 | QR |
| 3 | 2 | Reg. DDR3 ECC | 800,1066 | Mixing SR, DR |
| 3 | 2 | Reg. DDR3 ECC | 800 **(Note)** | Mixing SR, DR, QR |
| 3 | 3 | Reg. DDR3 ECC | 800 **(Note )** | Mixing SR, DR |
| **Note:** 1066 RDIMMs will run at 800 MHz (-BIOS automatic downgrading) | | | | |

| UDIMM Population for the Motherboard w/5500 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Unb.= Unbuffered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Unb. DDR3 ECC/Non-ECC | 800,1066,1333 | SR or DR |
| 3 | 2 | Unb. DDR3 ECC/Non-ECC | 800,1066 | Mixing SR, DR |
| 3 | 3 | Not available | Not available | Not available |

### *Memory Support for the Motherboard with the 5600 Processor(s) Installed*

- 1.5V DIMMs

| 1.5V RDIMM Population for the Motherboard w/5600 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Reg.=Registered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Reg. DDR3 ECC | 800,1066,1333 | SR or DR |
| 3 | 1 | Reg. DDR3 ECC | 800,1066 (Note 1) | QR |
| 3 | 2 | Reg. DDR3 ECC | 800,1066, 1333 | Mixing SR, DR |
| 3 | 2 | Reg. DDR3 ECC | 800 (Note 2) | Mixing SR, DR, QR |
| 3 | 3 | Reg. DDR3 ECC | 800 (Note 2) | Mixing SR, DR |
| **Note 1:** 1333 MHz RDIMMs will run at 1066 MHz (-BIOS automatic downgrading).<br>**Note 2:** 1333/1066 MHz RDIMMs will run at 800 MHz (-BIOS automatic downgrading).<br>**Note 3:** MIxing of 1.35V and 1.5V DIMMs is not recommended. | | | | |

| 1.5V UDIMM Population for the Motherboard w/5600 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Unb.= Unbuffered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Unb. DDR3 ECC/Non-ECC | 800,1066,1333 | SR or DR |
| 3 | 2 | Unb. DDR3 ECC/Non-ECC | 800,1066, 1333 | Mixing SR, DR |
| 3 | 3 | Not Available | Not Available | Not Available |
| **Note 1:** 1333 MHz for two DIMMs per channel is supported when Unbuf./ECC DIMMs are used.<br>**Note 2:** MIxing of 1.35V and 1.5V DIMMs is not recommended. | | | | |

- 1.35V DIMMs

| 1.35V RDIMM Population for the Motherboard w/5600 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Reg.=Registered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Reg. DDR3 ECC | 800,1066,1333 | SR or DR |
| 3 | 1 | Reg. DDR3 ECC | 800 (Note 1) | QR |
| 3 | 2 | Reg. DDR3 ECC | 800,1066 (Note 2) | Mixing SR, DR |
| 3 | 2 | Reg. DDR3 ECC | 800 (Note 3) | Mixing SR, DR, QR |
| 3 | 3 | Not Available | Not Available | Not Available |
| **Note 1:** 1333/1066 MHz QR RDIMMs will run at 800 MHz (-BIOS automatic downgrading).<br>**Note 2:** 1333 MHz SR/DR RDIMMs will run at 800 MHz (-BIOS automatic downgrading).<br>**Note 3:** 1333/1066 MHz SR/DR/QR RDIMMs will run at 800 MHz (-BIOS automatic downgrading).<br>**Note 4:** MIxing of 1.35V and 1.5V DIMMs is not recommended. | | | | |

| 1.35V UDIMM Population for the Motherboard w/5600 Processors Installed | | | | |
|---|---|---|---|---|
| **DIMM Slots per Channel** | **DIMMs Populated per Channel** | **DIMM Type (Unb.= Unbuffered)** | **Speeds (in MHz)** | **Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)** |
| 3 | 1 | Unb. DDR3 ECC | 800,1066,1333 | SR or DR |
| 3 | 2 | Unb. DDR3 ECC | 800,1066 | Mixing SR, DR |
| 3 | 3 | Not Available | Not Available | Not Available |
| **Note 1:** 1333 MHz for two DIMMs per channel is supported when Unbuf./ECC DIMMs are used.<br>**Note 2:** MIxing of 1.35V and 1.5V DIMMs is not recommended. | | | | |

**Note 1**: Due to OS limitations, some operating systems may not show more than 4 GB of memory.

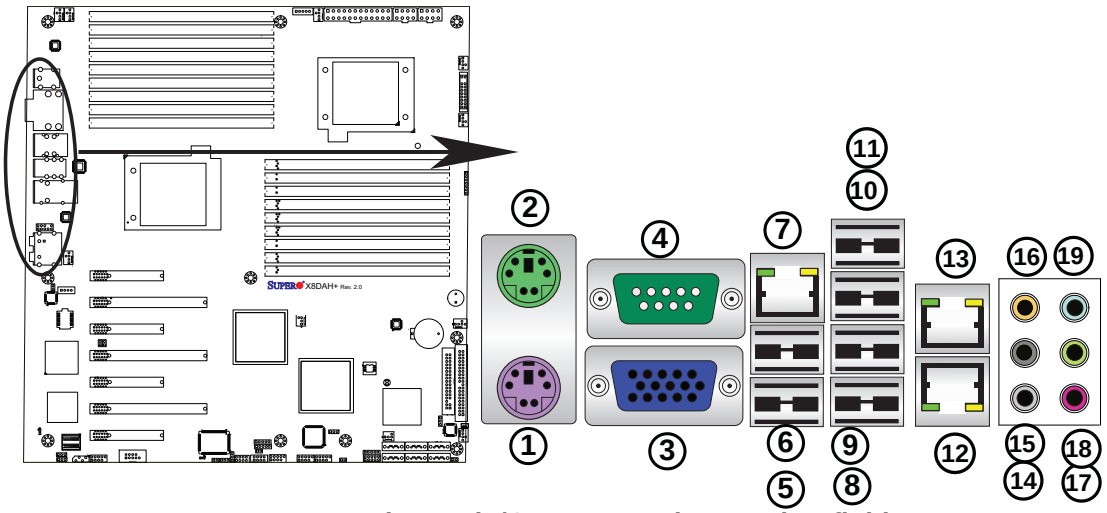
**Note 2**: Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (See the following Table.)

| Possible System Memory Allocation & Availability | | |
|---|---|---|
| System Device | Size | Physical Memory Remaining (-Available) (4 GB Total System Memory) |
| Firmware Hub flash memory (System BIOS) | 1 MB | 3.99 GB |
| Local APIC | 4 KB | 3.99 GB |
| Area Reserved for the chipset | 2 MB | 3.99 GB |
| I/O APIC (4 Kbytes) | 4 KB | 3.99 GB |
| PCI Enumeration Area 1 | 256 MB | 3.76 GB |
| PCI Express (256 MB) | 256 MB | 3.51 GB |
| PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary- | 512 MB | 3.01 GB |
| VGA Memory | 16 MB | 2.85 GB |
| TSEG | 1 MB | 2.84 GB |
| Memory available for the OS & other applications | | 2.84 GB |

## 2-5 Control Panel Connectors/IO Ports

The I/O ports are color coded in conformance with the PC 99 specification. See the picture below for the colors and locations of the various I/O ports.

### 1. Back Panel Connectors/IO Ports




**Back Panel I/O Port Locations and Definitions**

**Back Panel Connectors**

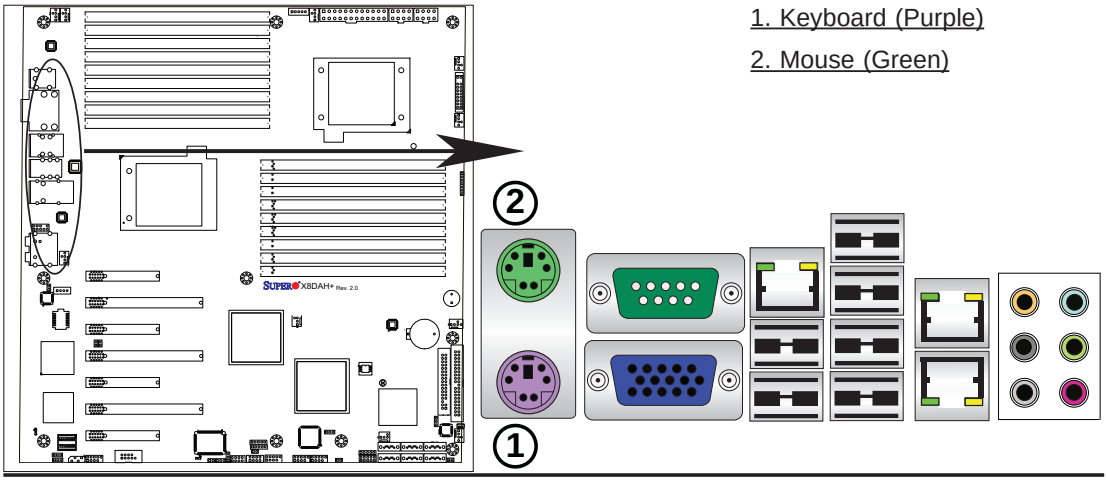
| | |
|---|---|
| 1. | Keyboard (Purple) |
| 2. | PS/2 Mouse (Green) |
| 3. | VGA (Blue) |
| 4. | COM Port 1 (Turquoise) |
| 5. | USB 0 |
| 6. | USB1 |
| 7. | IPMI_Dedicated LAN (X8DAH+-F only) |
| 8. | USB 2 |
| 9. | USB 3 |
| 10. | USB 4 |
| 11. | USB 5 |
| 12. | LAN 2 |
| 13. | LAN 1 |
| 14. | Side_surround |
| 15. | Back_surround |
| 16. | CEN/LFE |
| 17. | Microphone_In |
| 18. | Front |
| 19. | Line_In |

### ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located next to the Back Panel COM Port1 and VGA port on the motherboard. See the table at right for pin definitions.

**PS/2 Keyboard/Mouse Pin Definitions**

| PS2 Keyboard | | PS2 Mouse | |
|---|---|---|---|
| Pin# | Definition | Pin# | Definition |
| 1 | KB Data | 1 | Mouse Data |
| 2 | No Connection | 2 | No Connection |
| 3 | Ground | 3 | Ground |
| 4 | Mouse/KB VCC (+5V) | 4 | Mouse/KB VCC (+5V) |
| 5 | KB Clock | 5 | Mouse Clock |
| 6 | No Connection | 6 | No Connection |
| VCC: with 1.5A PTC (current limit) | | | |




1. Keyboard (Purple)
2. Mouse (Green)

### Serial Ports

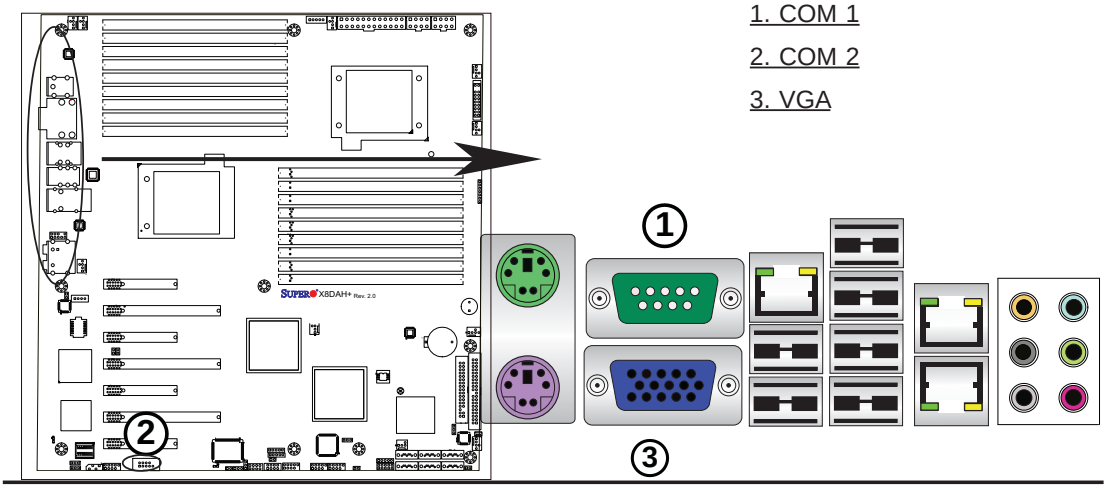
Two COM connections (COM1 & COM2) are located on the motherboard. COM1 is located on the Backplane IO panel. COM2 is located next to PCI-E Slot 1 to provide additional serial connection support. See the table on the right for pin definitions.

**Serial Ports-COM1/COM2 Pin Definitions**

| Pin # | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | DCD | 6 | DSR |
| 2 | RXD | 7 | RTS |
| 3 | TXD | 8 | CTS |
| 4 | DTR | 9 | RI |
| 5 | Ground | 10 | N/A |

### Video Connector

A Video (VGA) connector is located above COM Port1 on the IO backplane. This connector is used to provide video display. Refer to the board layout below for the location.




1. COM 1
2. COM 2
3. VGA

### Universal Serial Bus (USB)

Six Universal Serial Bus ports (USB 0/1, 2~5) are located on the I/O back panel. Additionally, four USB connections (USB 6/7, 8, 9) are on the motherboard to provide front chassis access. (Cables are not included). See the tables on the right for pin definitions.

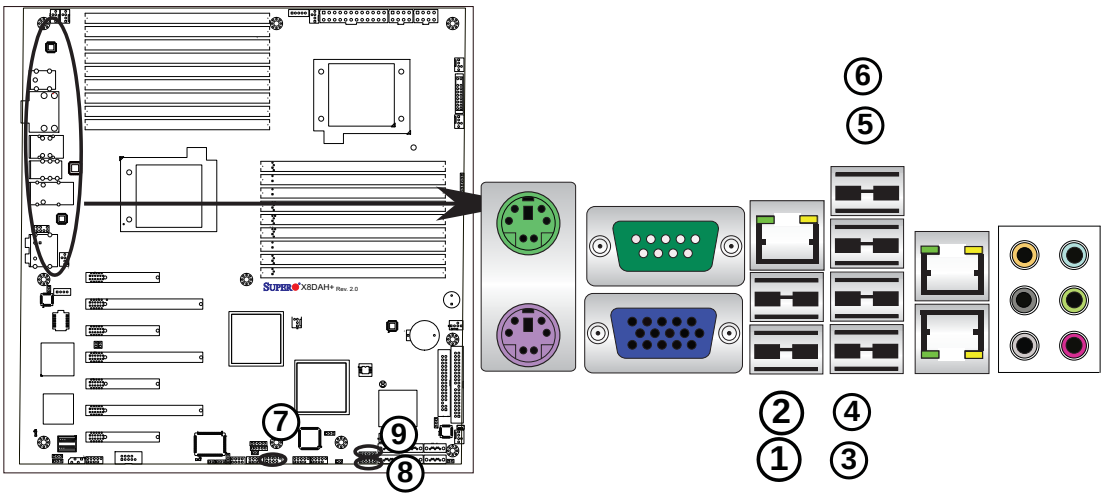
**Back Panel USB (USB 0/1, 2~5)**

| Pin# | Definitions |
|---|---|
| 1 | +5V |
| 2 | PO- |
| 3 | PO+ |
| 4 | Ground |
| 5 | N/A |

**Front Panel USB Pin Definitions (USB6/7, 8/9)**

| USB 6/8 Pin # | Definition | USB 7/9 Pin # | Definition |
|---|---|---|---|
| 1 | +5V | 1 | +5V |
| 2 | PO- | 2 | PO- |
| 3 | PO+ | 3 | PO+ |
| 4 | Ground | 4 | Ground |
| 5 | Key | 5 | No connection |

1. Backpanel USB 0
2. Backpanel USB 1
3. Backpanel USB 2
4. Backpanel USB 3
5. Backpanel USB 4
6. Backpanel USB 5
7. (JUSB4) Front Panel USB 6/7
8. (JUSB2) Front Panel USB 8
9. (JUSB5) Front Panel USB 9



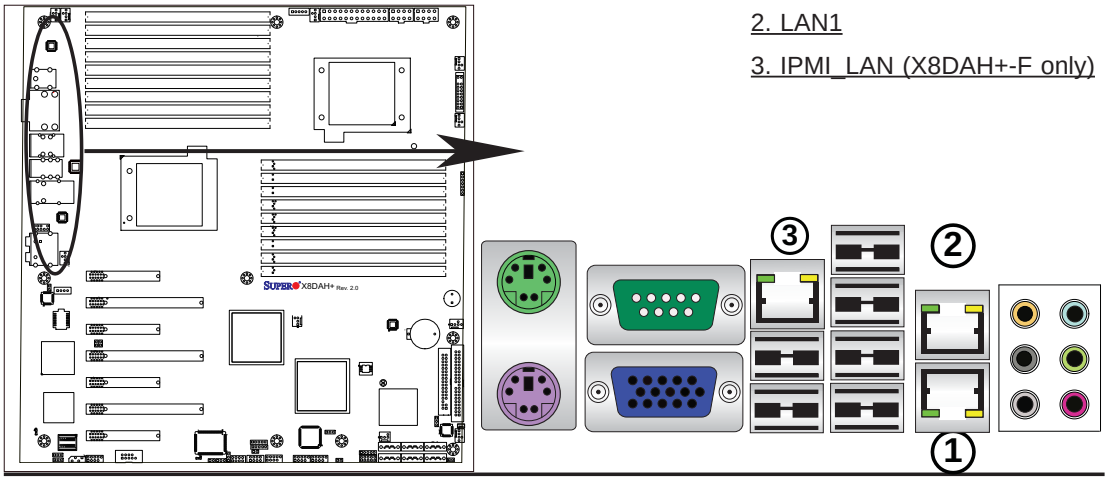
### Ethernet Ports

Two Ethernet ports (LAN 1/LAN2) are located at on the IO backplane. In addition, a dedicated LAN is also located on the X8DAH+-F to provide KVM support for IPMI 2.0. All these ports accept RJ45 type cables. (**Note**: Please refer to the LED Indicator Section for LAN LED information.)

**LAN Ports Pin Definition**

| Pin# | Definition | | |
|---|---|---|---|
| 1 | P2V5SB | 10 | SGND |
| 2 | TD0+ | 11 | Act LED |
| 3 | TD0- | 12 | P3V3SB |
| 4 | TD1+ | 13 | Link 100 LED (Yellow, +3V3SB) |
| 5 | TD1- | 14 | Link 1000 LED (Yellow, +3V3SB) |
| 6 | TD2+ | 15 | Ground |
| 7 | TD2- | 16 | Ground |
| 8 | TD3+ | 17 | Ground |
| 9 | TD3- | 88 | Ground |

(NC: No Connection)



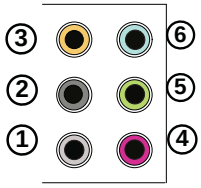

1. LAN2
2. LAN1
3. IPMI_LAN (X8DAH+-F only)

### (Back_Panel) High Definition Audio (HD Audio)

This motherboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels. The HD Audio connections simultaneously supports multiple-streaming 7.1 sound playback with 2 channels of independent stereo output through the front panel stereo out for front L&R, rear L&R, center and subwoofer speakers. Use the Advanced software included in the CD-ROM with your motherboard to enable this function.

| (BP) HD Audio | |
|---|---|
| Conn# | Signal |
| 1 | Side_Surround |
| 2 | Back_Surround |
| 3 | CEN/LFE |
| 4 | Microphone_In |
| 5 | Front |
| 6 | Line_In |

**HD Audio**

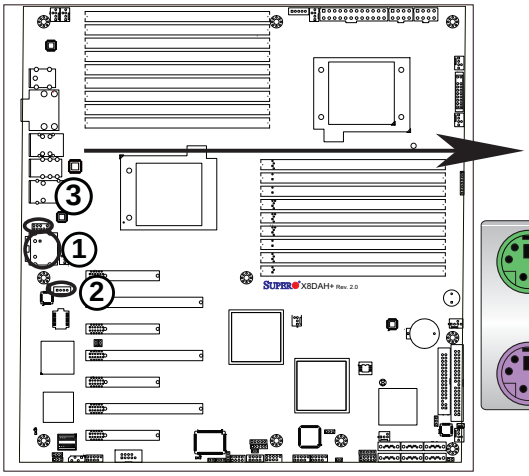



### CD &10-pin Audio Headers

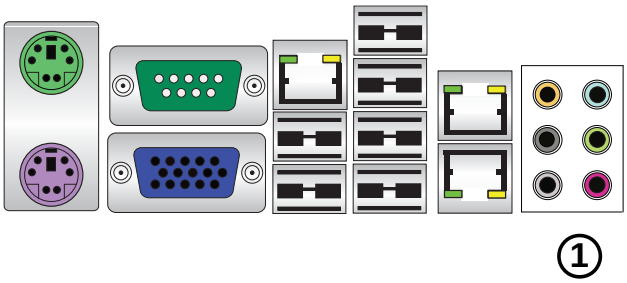
A 4-pin CD header (CD1) and a 10-pin Audio header are also located on the motherboard. These headers allow you to use the onboard sound for audio CD playback. Connect an audio cable from your CD drive to the CD header that fits your cable's connector. See the tables at right for pin definitions for these headers.

| CD1 Pin Definition | |
|---|---|
| Pin# | Definition |
| 1 | Left |
| 2 | Ground |
| 3 | Ground |
| 4 | Right |

| 10-in Audio Pin Definitions | |
|---|---|
| Pin# | Signal |
| 1 | Microphone_Left |
| 2 | Audio_Ground |
| 3 | Microphone_Right |
| 4 | Audio_Detect |
| 5 | Line_2_Right |
| 6 | Ground |
| 7 | Jack_Detect |
| 8 | Key |
| 9 | Line_2_Left |
| 10 | Ground |



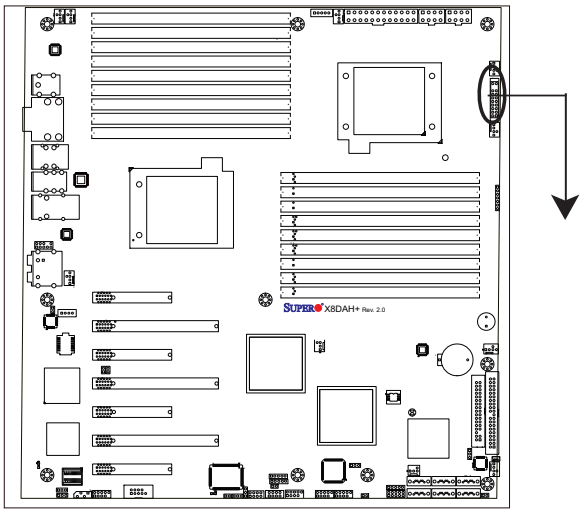

1. HD Audio (See the graphics above for details)
2. CD1
3. 10-pin Audio

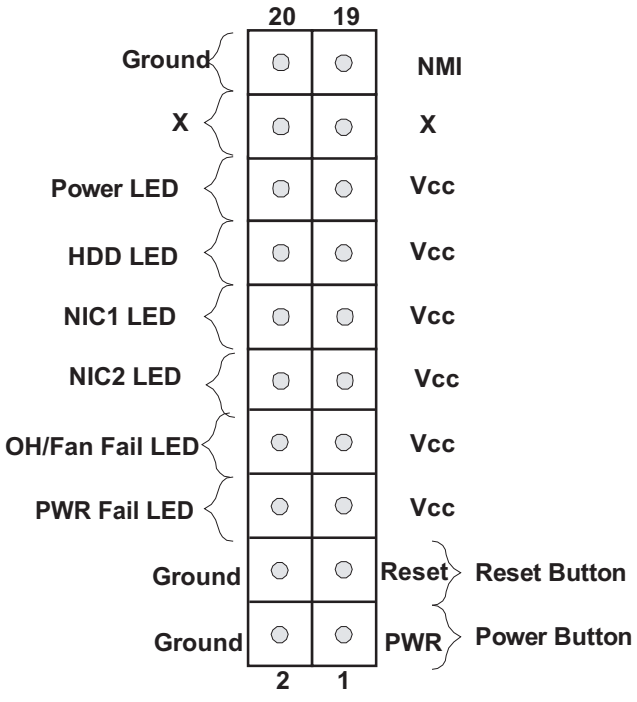


## 2. Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro server chassis. See the figure below for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

**JF1 Header Pins**





## 3. Front Control Panel Pin Definitions

### NMI Button

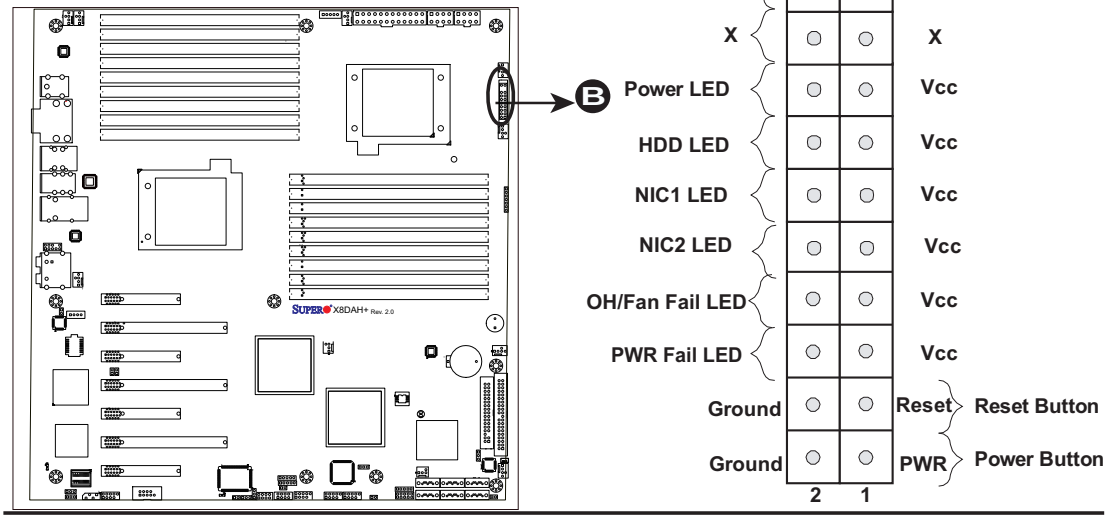
The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

| NMI Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 19 | Control |
| 20 | Ground |

### Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

| Power LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 15 | +5V |
| 16 | Ground |



### HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate HDD activities. See the table on the right for pin definitions.

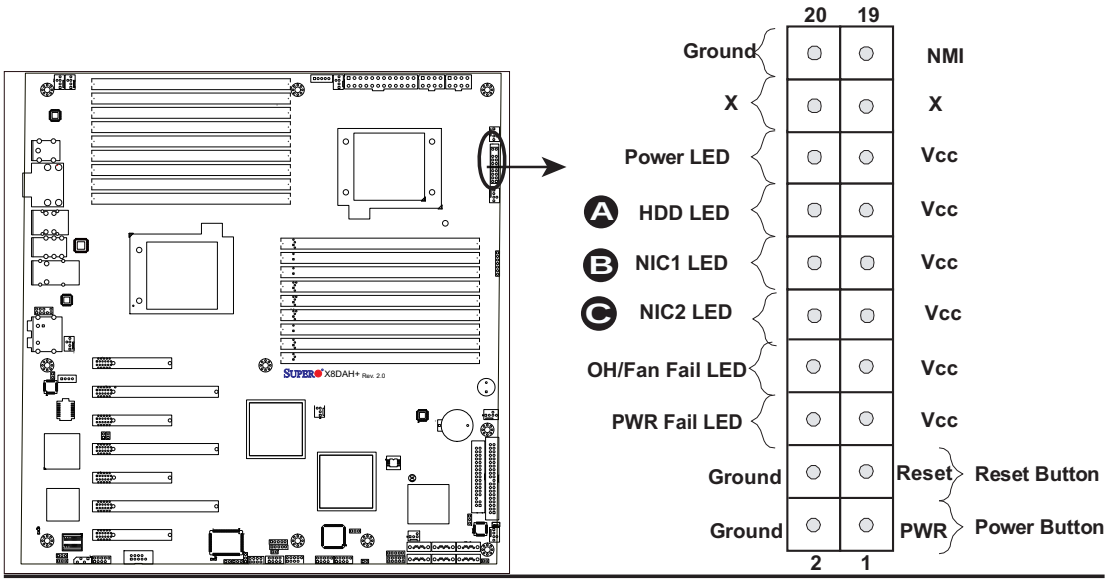
| HDD LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 13 | +5V |
| 14 | HD Active |

### NIC1/NIC2 LED Indicators

The NIC (Network Interface Controller) LED connection for GLAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for GLAN Port 2 is on Pins 9 and 10. Attach the NIC LED cables to display network activity. Refer to the table on the right for pin definitions.

| GLAN1/2 LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 9/11 | Vcc |
| 10/12 | Ground |

A. HDD LED
B. NIC1 LED
C. NIC2 LED



### Overheat (OH)/Fan Fail LED

Connect an LED cable to the Front UID and OH/Fan Fail connections on pins 7 and 8 of JF1 to provide advanced warnings for chassis overheat/fan failure. Refer to the table on the right for pin definitions.

| OH/Fan Fail LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 7 | Vcc |
| 8 | OH/Fan Fail LED |

| OH/Fan Fail Indicator Status | |
|---|---|
| State | Definition |
| Off | Normal |
| On | Overheat |
| Flashing | Fan Fail |

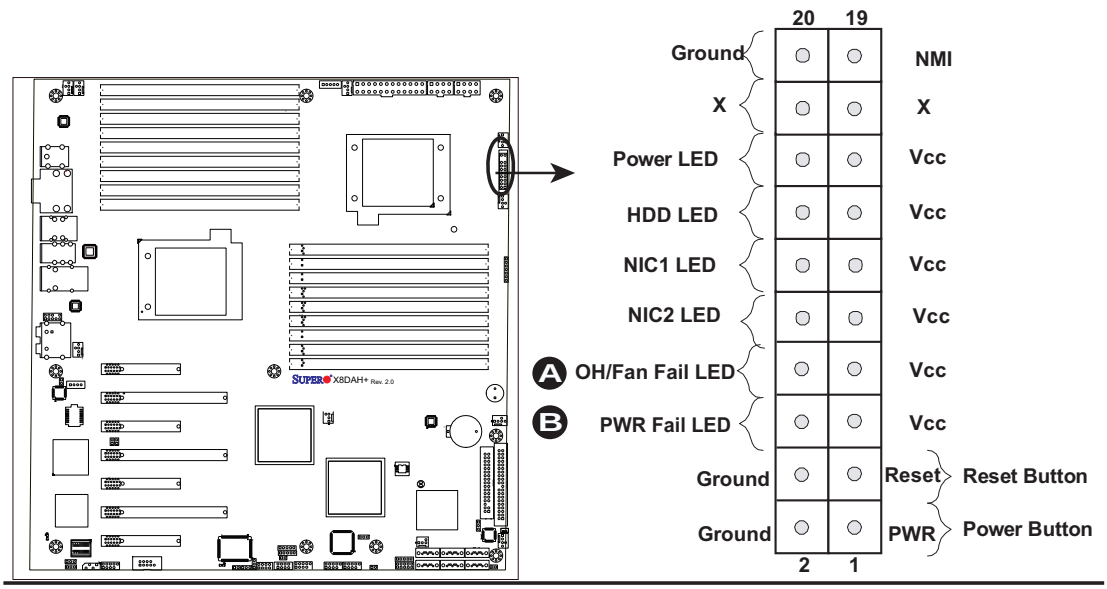
### Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

| PWR Fail LED Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 5 | Vcc |
| 6 | Ground |

A. OH/Fan Fail & UID LEDs

B. PWR Supply Fail



### Reset Button

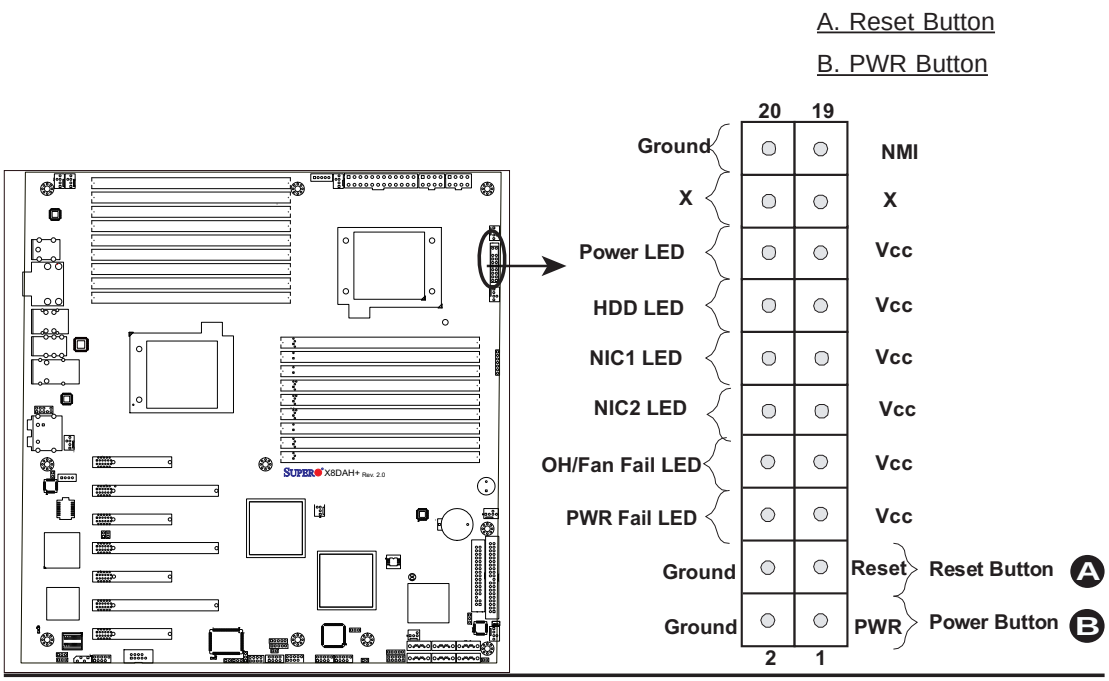
The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

| Reset Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 3 | Reset |
| 4 | Ground |

### Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

| Power Button Pin Definitions (JF1) | |
|---|---|
| Pin# | Definition |
| 1 | Signal |
| 2 | +3V Standby |



# 2-6 Connecting Cables

### Power Connectors

A 24-pin main power supply connector (JPW1) and two 8-pin CPU PWR connectors (JPW2/JPW3) on the motherboard. These power connectors meet the SSI EPS 12V specification. In addition to the 24-pin ATX power connector, the 12V 8-pin CPU PWR connectors at JPW2/JPW3 must also be connected to your power supply. See the table on the right for pin definitions.

**Warning**: To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the two 8-pin (JPW2,JPW3) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

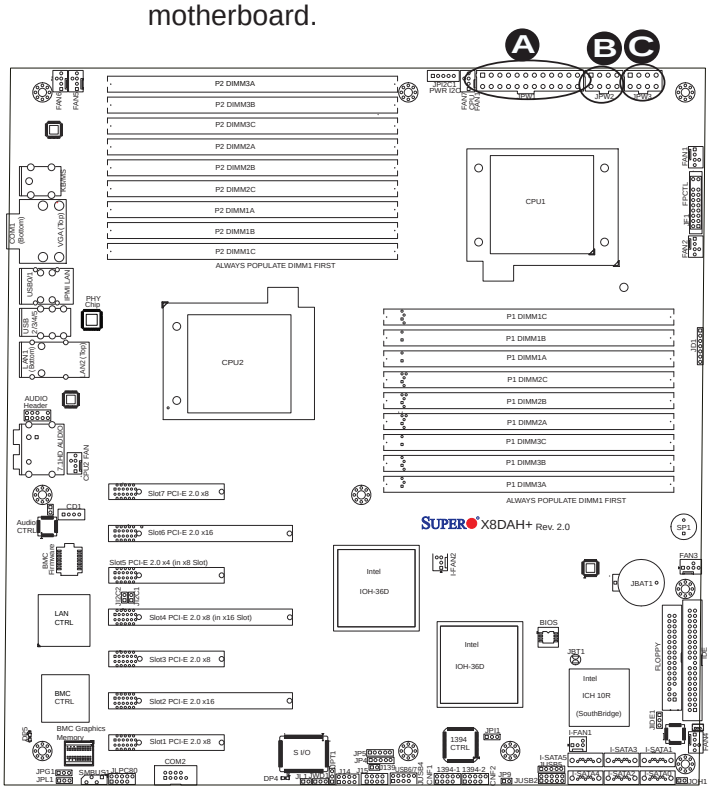
**ATX Power 24-pin Connector Pin Definitions**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 13 | +3.3V | 1 | +3.3V |
| 14 | -12V | 2 | +3.3V |
| 15 | COM | 3 | COM |
| 16 | PS_ON | 4 | +5V |
| 17 | COM | 5 | COM |
| 18 | COM | 6 | +5V |
| 19 | COM | 7 | COM |
| 20 | Res (NC) | 8 | PWR_OK |
| 21 | +5V | 9 | 5VSB |
| 22 | +5V | 10 | +12V |
| 23 | +5V | 11 | +12V |
| 24 | COM | 12 | +3.3V |

**12V 8-pin PWR Connector Pin Definitions**

| Pins | Definition |
|---|---|
| 1 through 4 | Ground |
| 5 through 8 | +12V |

**(Required)**




A. 24-pin ATX PWR (Req'd)
B/C.8-pin Processor PWR (Req'd)

## Fan Headers

This motherboard has six chassis/system fan headers (Fan 1 to Fan6) and two CPU fans (CPU1 Fan/CPU2 Fan) on the motherboard. In addition, I-Fan 1 and I-Fan 2 are available on a R 2.0 or newer version motherboard for IOH-36D cooling. The 4-pin fans headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only via Hardware Monitoring in the Advanced Setting in the BIOS. See the table on the right for pin definitions.

**Fan Header Pin Definitions**

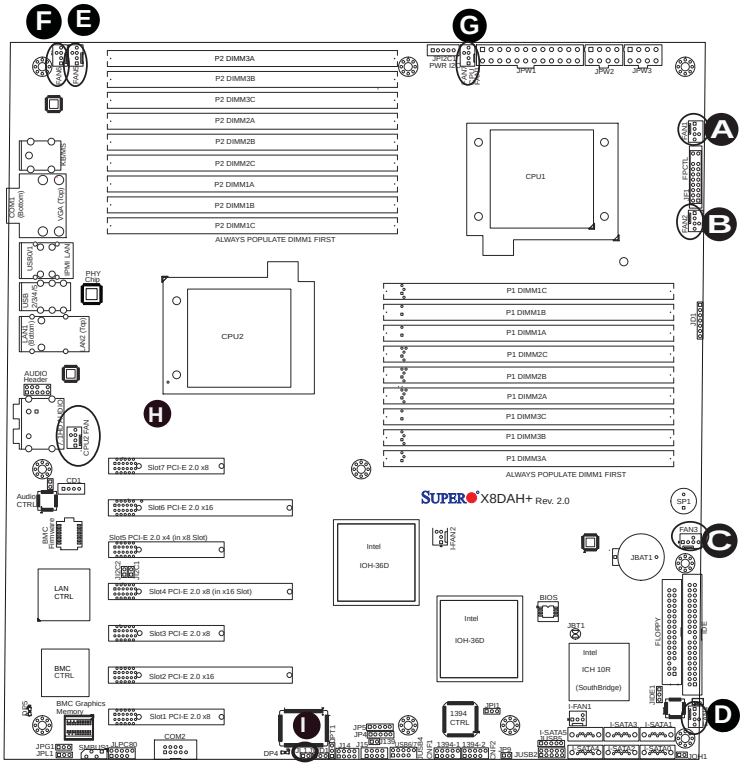
| Pin# | Definition |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Tachometer |
| 4 | PWR Modulation |

## Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

**Chassis Intrusion Pin Definitions (JL1)**

| Pin# | Definition |
|---|---|
| 1 | Intrusion Input |
| 2 | Ground |



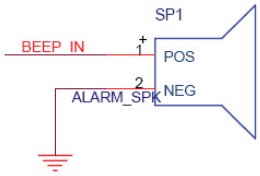

A. Fan 1
B. Fan 2
C. Fan 3
D. Fan 4
E. Fan 5
F. Fan 6
G. CPU1 Fan
H. CPU2 Fan
I. Chassis Intrusion

## Internal Speaker

The Internal Speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the locations of the Internal Buzzer (SP1).

**Internal Buzzer (SP1) Pin Definition**

| Pin# | | Definitions |
|---|---|---|
| Pin 1 | Pos. (+) | Beep In |
| Pin 2 | Neg. (-) | Alarm Speaker |




## Power LED/Speaker

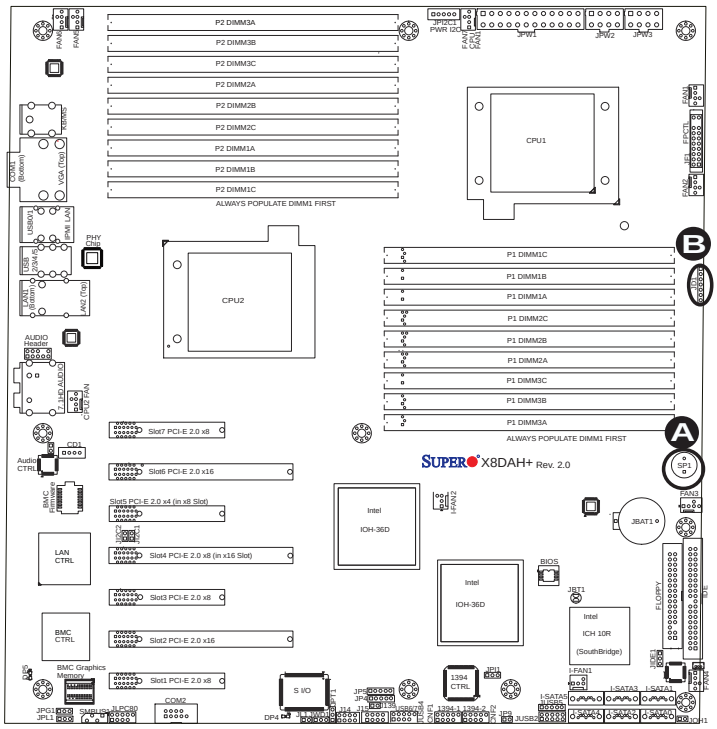
On the JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are for use with an external speaker. If you wish to use the on-board speaker, you should close pins 6-7 with a jumper.

**PWR LED Connector Pin Definitions**

| Pin Setting | Definition |
|---|---|
| Pin 1 | Anode (+) |
| Pin2 | Cathode (-) |
| Pin3 | NA |

**Speaker Connector Pin Definitions**

| Pin Setting | Definition |
|---|---|
| Pins 4-7 | External Speaker |
| Pins 6-7 | Internal Speaker |




A. Internal Speaker (Buzzer)

B. PWR LED/Speaker

## IEEE 1394a Connection

CNF1 and CNF2 provide the IEEE 1394a connections on the motherboard. See the tables on the right for pin definitions.

**CNF1 Pin Definitions**

| Pin# | Defin. | Pin# | Defin |
|---|---|---|---|
| 1 | PTPA0+ | 2 | PTPA0- |
| 3 | GND | 4 | GND |
| 5 | PTPB0+ | 6 | PTPB0- |
| 7 | PWR 1394a | 8 | PWR 1394a |
| | | 10 | ZX |

**CNF2 Pin Definitions**

| Pin# | Defin. | Pin# | Defin |
|---|---|---|---|
| 1 | PTPA1+ | 2 | PTPA1- |
| 3 | GND | 4 | GND |
| 5 | PTPB1+ | 6 | PTPB1- |
| 7 | PWR 1394a | 8 | PWR 1394a |
| | | 10 | ZY |

### Overheat LED/Fan Fail (JOH1)

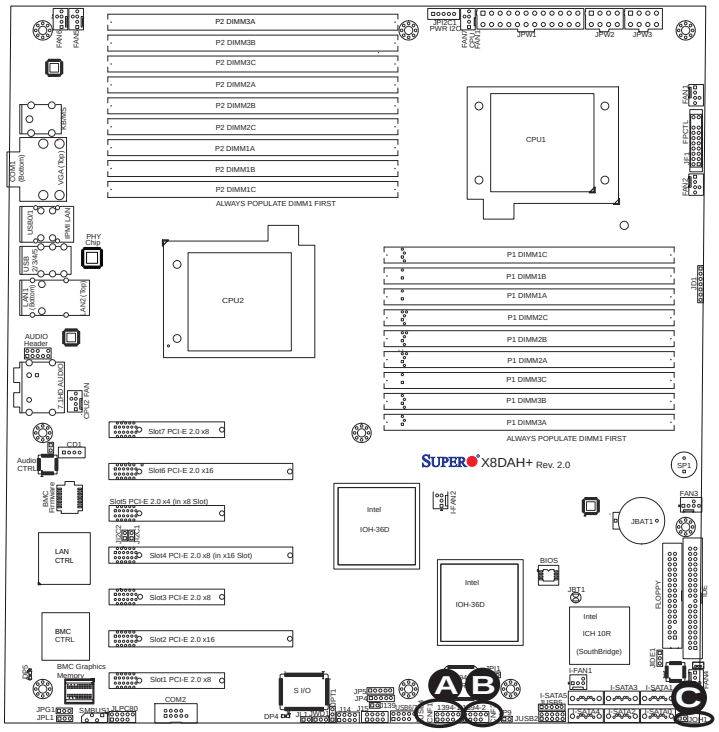
The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating or fan failure. This LED will blink when a fan failure occurs. Refer to the table on right for pin definitions.

**Overheat LED Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | 5vDC |
| 2 | OH Active |

**OH/Fan Fail LED Pin Definitions**

| State | Message |
|---|---|
| Solid | Overheat |
| Blinking | Fan Fail |




A. CNF1 (1394a-1)

B. CNF2 (1394a-2)

C. Overheat LED (JOH1)

### System Management Bus

A System Management Bus header is located at SUBUS1 on the motherboard. Connect the appropriate cable here to use the SMB connection on your system.

**SMB Header Pin Definitions**

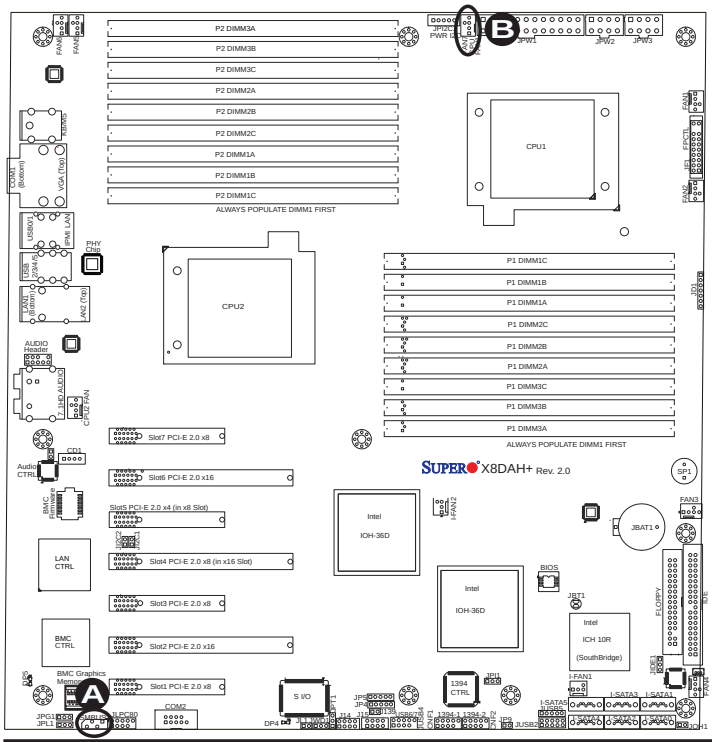
| Pin# | Definition |
|---|---|
| 1 | Data |
| 2 | Ground |
| 3 | Clock |
| 4 | No Connection |

### Power SMB (I²C) Connector

Power System Management Bus (I²C) Connector (JPI²C) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

**PWR SMB Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | Clock |
| 2 | Data |
| 3 | PWR Fail |
| 4 | Ground |
| 5 | +3.3V |



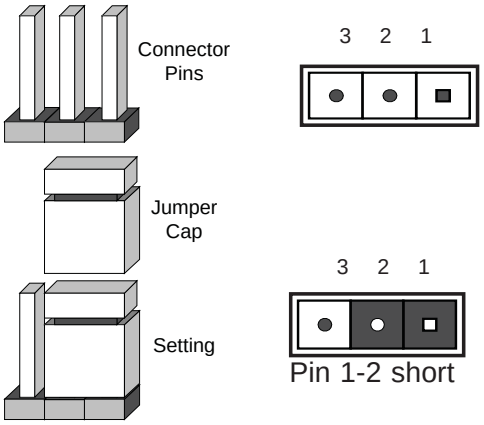

A. SMB

B. PWR SMB

# 2-7 Jumper Settings

## Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

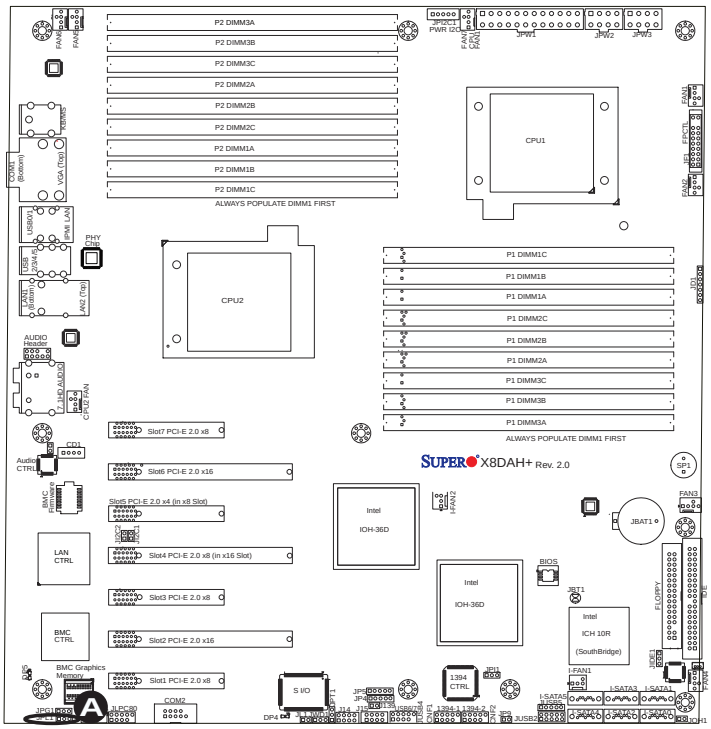



**Note:** On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

### GLAN Enable/Disable

Use JPL1 to enable or disable GLAN Port1/GLAN Port2 on the motherboard. See the table on the right for jumper settings. The default setting is **Enabled.**

| GLAN Enable Jumper Settings | |
|---|---|
| Pin# | Definition |
| 1-2 | Enabled (default) |
| 2-3 | Disabled |




A. GLAN Port 1/2 Enable

### CMOS Clear

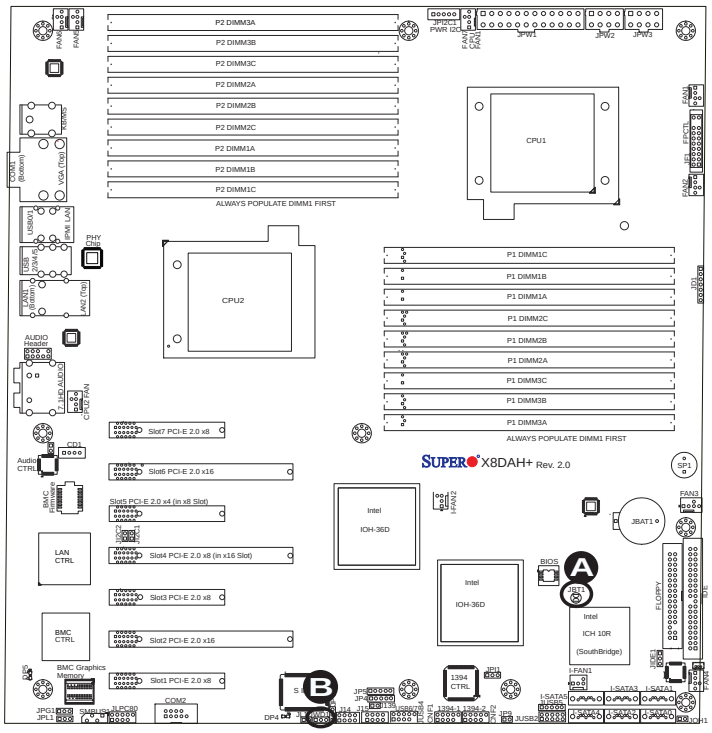
JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

**Note:** For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS.

### Watch Dog Enable/Disable

Watch Dog (JWD) is a system monitor that can reboot the system when a software application hangs. Close Pins 1-2 to reset the system if an application hangs. Close Pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

| Watch Dog Jumper Settings (JWD) | |
|---|---|
| Jumper Setting | Definition |
| Pins 1-2 | Reset (default) |
| Pins 2-3 | NMI |
| Open | Disabled |




A. Clear CMOS

B. Watch Dog Enable

### I²C Bus to PCI-Exp. Slots

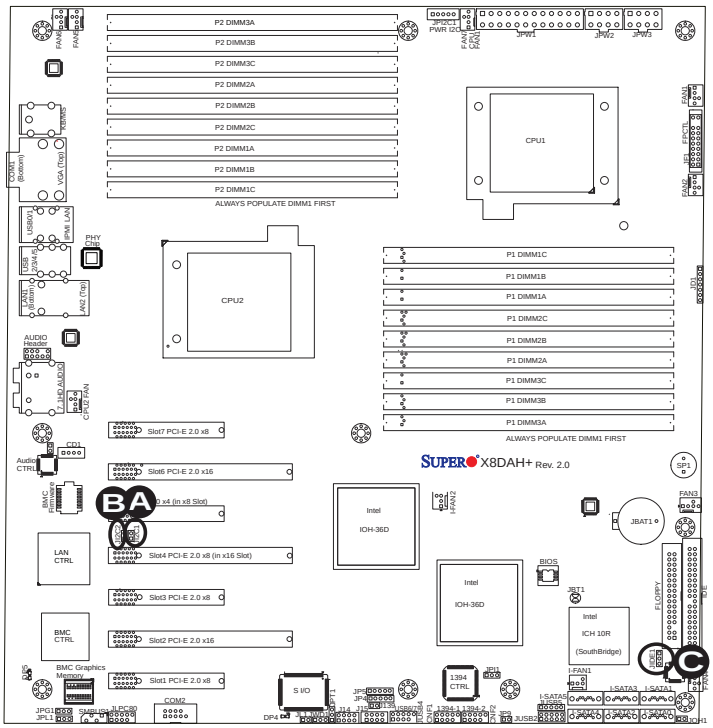
Jumpers JI²C1 and JI²C2 allow you to connect the System Management Bus (I²C) to PCI and PCI-Express slots. These two jumpers are to be set at the same time. The default setting is Open to disable the connections. See the table on the right for jumper settings.

| I²C for PCI/PCI-E slots Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| Closed | Enabled |
| Open | Disabled (Default) |

### Compact Flash Enable

A Compact Flash Jumper is located at JPIDE1. To use a Compact Flash Card on this motherboard, you will need to close Pins 1~2 on this jumper to enable it. For the Compact Flash Card to work properly, please connect the Compact Flash Card power cable to JWF1 first. Refer to the board layout below for the location.

| Compact Flash Card Enable Jumper Settings | |
|---|---|
| Jumper | Definition |
| Open | Disabled |
| Closed | Enabled |




A. JI²C1
B. JI²C2
C. Compact Flash Enable

### VGA Enable

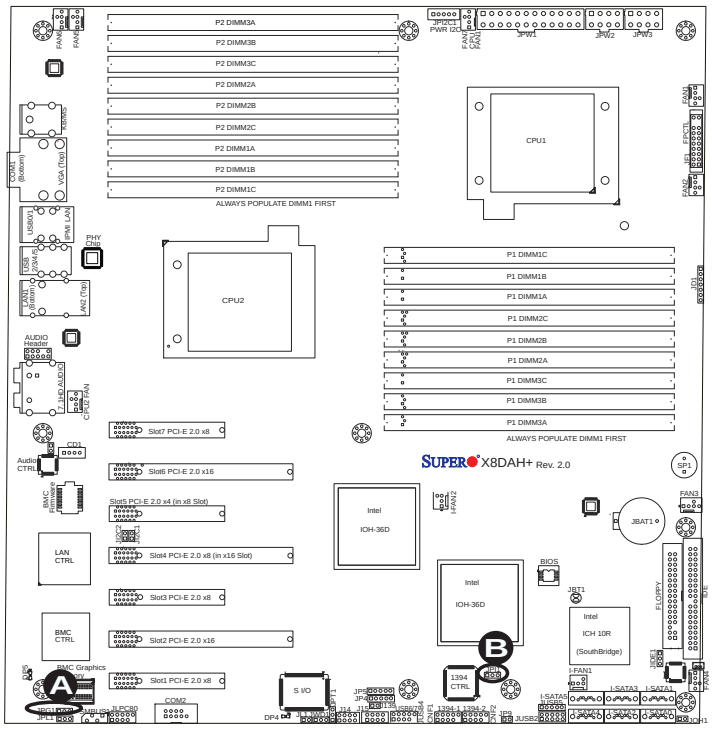
Jumper JPG1 allows you to enable video connections on the motherboard. See the table on the right for jumper settings.

| VGA Enable Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| 1~2 | Enabled (Default) |
| 2~3 | Disabled |

### 1394a-1/1394a-2 Enable

Use Jumper JPI1 to enable the 1394a connections at CNF1(1394a-1)/CNF2 (1394a-2) on the motherboard. See the table on the right for jumper settings.

| 1394a Enable Jumper Settings | |
|---|---|
| Jumper Setting | Definition |
| 1~2 | Enabled (Default) |
| 2~3 | Disabled |



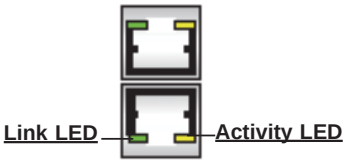

A. VGA Enable

B. 1394a 1/2 Enable

# 2-8 Onboard LED Indicators

## GLAN LEDs

Two LAN ports (LAN 1/LAN 2) are located on the IO Backplane of the motherboard. Each Ethernet LAN port has two LEDs. The green LED indicates activity, while the other Link LED may be green, amber or off to indicate the speed of the connections. See the tables at right for more information.




**Rear View** (when facing the rear side of the chassis)

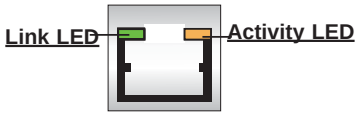
| LAN 1/LAN 2 Activity LED (Right) LED State | | |
|---|---|---|
| Color | Status | Definition |
| Green | Flashing | Active |

| LAN 1/LAN 2 Link LED (Left) LED State | |
|---|---|
| LED Color | Definition |
| Off | No Connection or 10 Mbps |
| Green | 100 Mbps |
| Amber | 1 Gbps |

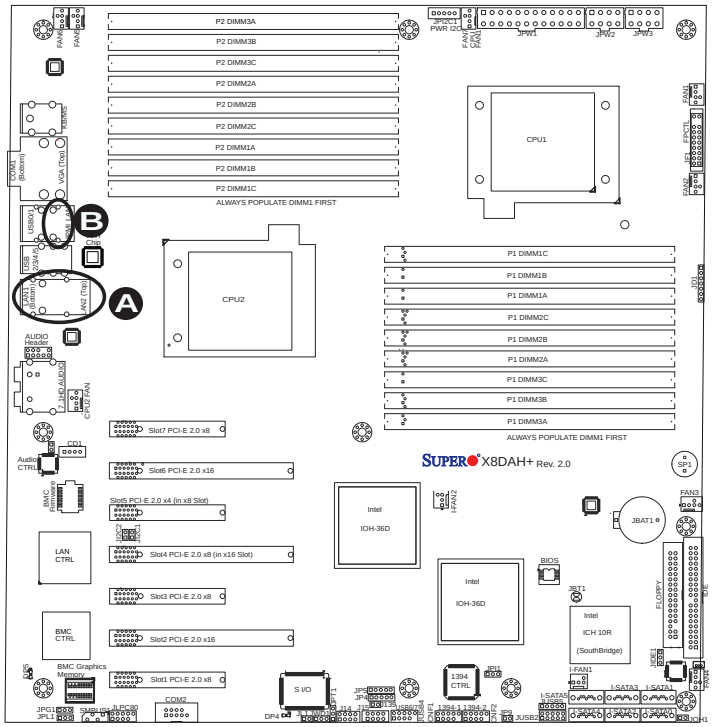
## IPMI Dedicated LAN LEDs (X8DAH+-F)

In addition to LAN 1/LAN 2, an IPMI Dedicated LAN is also located on the IO Backplane of the X8DAH+-F. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the tables at right for more information.

**IPMI LAN (X8DAH+-F only)**




| IPMI LAN Link LED (Left) & Activity LED (Right) | | |
|---|---|---|
| Color | Status | Definition |
| Link (Left) | Green: Solid | 100 Mbps |
| Activity (Right) | Amber: Blinking | Active |




A. LAN1/2 LEDs

B. Dedicated LAN LEDs (X8DAH+-F)

### Onboard Power LED

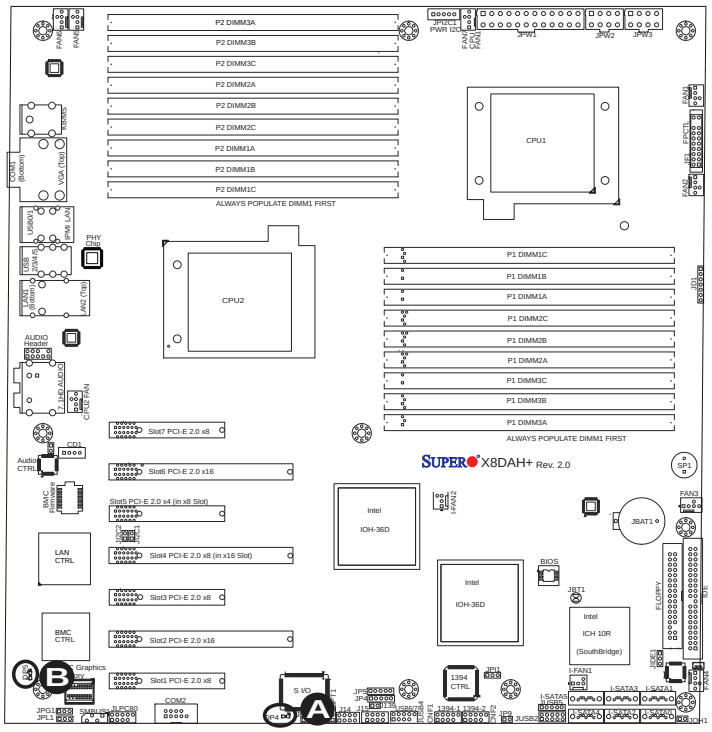
An Onboard Power LED is located at DP4 on the motherboard. When this LED is lit, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

| Onboard PWR LED (DP4) Settings | |
|---|---|
| LED Color | Definition |
| Off | System Off (PWR cable not connected) |
| On | System Power On |

### BMC Heartbeat LED (X8DAH+-F)

A BMC Heartbeat LED is located at DP5 on the motherboard. When DP5 is blinking, BMC functions normally. See the tables at right for more information.

| BMC Heartbeat LED Indicator (DP5) Settings | |
|---|---|
| LED Color | Definition |
| Blinking | BMC: Normal |




A. Onboard PWR LED

B. BMC Heartbeat LED

# 2-9 Floppy Drive, Serial ATA and SAS Connections

Note the following when connecting the floppy and hard disk drive cables:

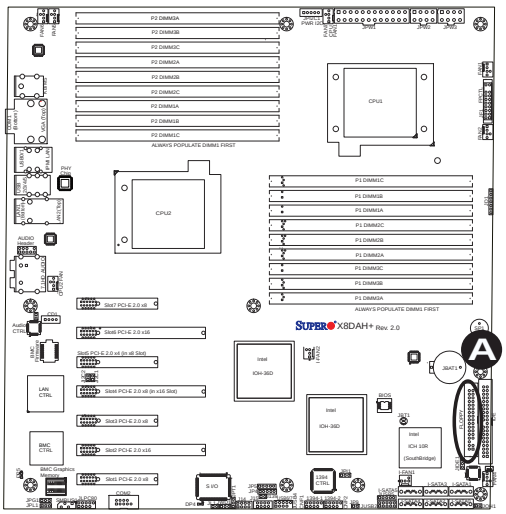
- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

### Floppy Connector

The floppy connector is located next to the Super I/O chip on the motherboard. See the table on the right for pin definitions.

**Floppy Drive Connector Pin Definitions**

| Pin# | Definition | Pin # | Definition |
|---|---|---|---|
| 1 | Ground | 2 | FDHDIN |
| 3 | Ground | 4 | Reserved |
| 5 | Key | 6 | FDEDIN |
| 7 | Ground | 8 | Index |
| 9 | Ground | 10 | Motor Enable |
| 11 | Ground | 12 | Drive Select B |
| 13 | Ground | 14 | Drive Select B |
| 15 | Ground | 16 | Motor Enable |
| 17 | Ground | 18 | DIR |
| 19 | Ground | 20 | STEP |
| 21 | Ground | 22 | Write Data |
| 23 | Ground | 24 | Write Gate |
| 25 | Ground | 26 | Track 00 |
| 27 | Ground | 28 | Write Protect |
| 29 | Ground | 30 | Read Data |
| 31 | Ground | 32 | Side 1 Select |
| 33 | Ground | 34 | Diskette |

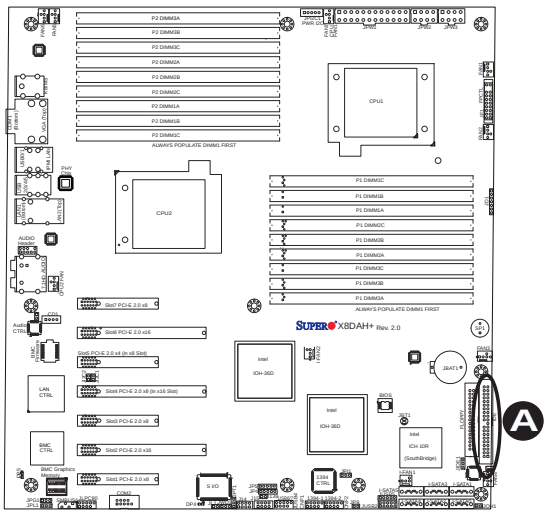



A. Floppy

## IDE Connector

AN IDE Connector is located on the motherboard. This connector can be used for a Compact Flash card. To use a Compact Flash card on this connector, you will need to enable the jumper located at JPIDE1. See the table on the right for pin definitions.

| IDE Drive Connector Pin Definitions | | | |
|---|---|---|---|
| Pin# | Definition | Pin # | Definition |
| 1 | Reset IDE | 2 | Ground |
| 3 | Host Data 7 | 4 | Host Data 8 |
| 5 | Host Data 6 | 6 | Host Data 9 |
| 7 | Host Data 5 | 8 | Host Data 10 |
| 9 | Host Data 4 | 10 | Host Data 11 |
| 11 | Host Data 3 | 12 | Host Data 12 |
| 13 | Host Data 2 | 14 | Host Data 13 |
| 15 | Host Data 1 | 16 | Host Data 14 |
| 17 | Host Data 0 | 18 | Host Data 15 |
| 19 | Ground | 20 | Key |
| 21 | DRQ3 | 22 | Ground |
| 23 | I/O Write | 24 | Ground |
| 25 | I/O Read | 26 | Ground |
| 27 | IOCHRDY | 28 | BALE |
| 29 | DACK3 | 30 | Ground |
| 31 | IRQ14 | 32 | IOCS16 |
| 33 | Addr1 | 34 | Ground |
| 35 | Addr0 | 36 | Addr2 |
| 37 | Chip Select 0 | 38 | Chip Select 1 |
| 39 | Activity | 40 | Ground |



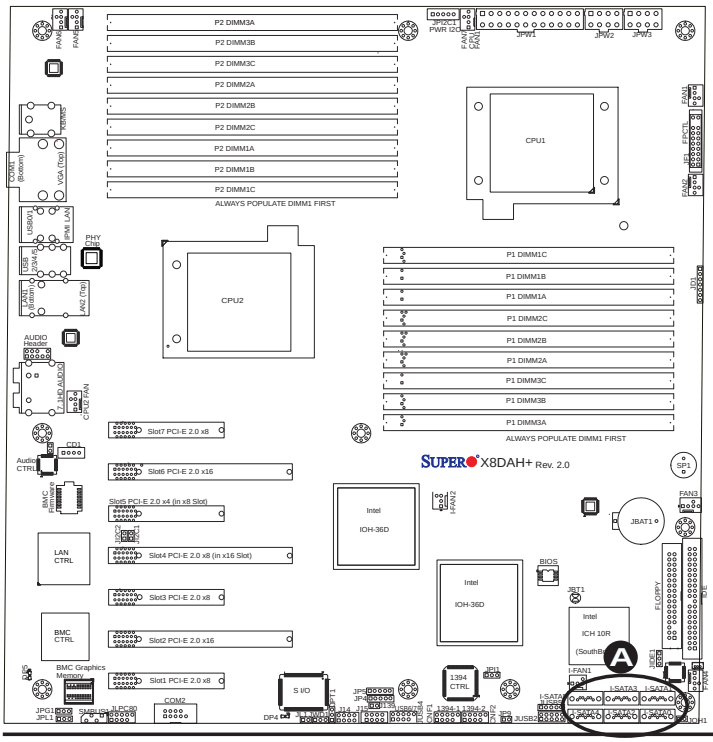

A. IDE

### Serial ATA Ports

There are Six Serial ATA Ports (I-SATA0~I-SATA 5) located on the motherboard. These ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. See the table on the right for pin definitions.

**Serial ATA Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | Ground |
| 2 | TX_P |
| 3 | TX_N |
| 4 | Ground |
| 5 | RX_N |
| 6 | RX_P |
| 7 | Ground |




A. SATA 0~5

# Chapter 3

# Troubleshooting

## 3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Note: Always disconnect the power cord before adding, changing or installing any hardware components.

### Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install CPU 1 first (making sure it is fully seated) and connect the chassis speaker and the power LED to the motherboard. (Check all jumper settings as well.)

### No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

## No Video

1. If the power is on but you have no video, remove all the add-on cards and cables.

2. Use the speaker to determine if any beep codes exist. Refer to the Appendix for details on beep codes.

## Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.

2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

## Memory Errors

When a No_Memory_Beep_Code is issued by the system, check the following:

1. Make sure that the DIMM modules are properly and fully installed.

2. Check if different speeds of DIMMs have been installed and check if the BIOS setup is configured for the fastest speed of RAM used. (It is recommended to use the same RAM speed for all DIMMs in the system.)

3. Make sure you are using the correct type of DDR3 Registered ECC or Unbuffered ECC/Non-ECC 1333 MHz/1066 MHz/800 MHz SDRAM (recommended by the manufacturer.)

4. Check for bad DIMM modules or slots by swapping a single module between all memory slots and check the results.

5. Make sure that all memory modules are fully seated in their slots. Make sure to follow the instructions given on DIMM population in Section 2-3 in Chapter 2.

6. Check the position of the 115V/230V switch on the power supply.

7. Please follow the instructions given in the DIMM Population Tables listed in Section 2-4 to install your memory modules.

## 3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a motherboard manufacturer, Supermicro does not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/support/faqs/) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our website at (http://www.supermicro.com/support/bios/).

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

- Motherboard model and PCB revision number
- BIOS release date/version (this can be seen on the initial display when your system first boots up)
- System configuration
- An example of a Technical Support form is on our website at (http://www.supermicro.com/support/contact.cfm).
- Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com or by fax at: (408) 503-8000, option 2.

## 3-3 Frequently Asked Questions

**Question: What are the various types of memory that my motherboard can support?**

**Answer:** This motherboard has 18 240-pin DIMM slots that support DDR3 Registered ECC or Unbuf. ECC/Non-ECC 1333 MHz/1066 MHz/800 MHz SDRAM

modules. It is strongly recommended that you do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 2-3 in Chapter 2.

**Question: How do I update my BIOS?**

**Answer:** It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at http://www.supermicro.com/support/bios/. Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision and make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format flash.bat filename.rom from your bootable USB device to flash the BIOS. Then, your system will automatically reboot. Please note that this process may take a few minutes to complete. Do not be concerned if the screen is paused for a few minutes.

**Warning**: Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure!

**Note**: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department for repair.

**Question: What's on the CD that came with my motherboard?**

**Answer:** The supplied CD has drivers and programs that are needed for your system. Please review the CD and install the applications you need. Applications on the CD include chipset drivers for the Windows OS, security and audio drivers.

## 3-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete. For faster service, You can also request a RMA authorization online (http://www.supermicro.com/support/rma/).

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

# Chapter 4

# BIOS

## 4-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8DAH+/X8DAH+-F. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

### Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

**Note**: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

**Note**: Options printed in **Bold** are default settings.

### How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

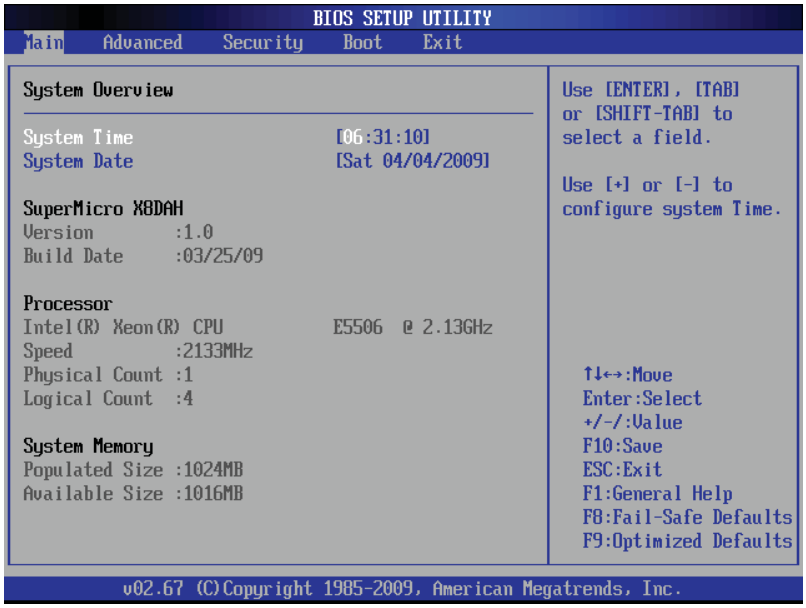
### Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

**Warning!** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

## 4-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.




**System Overview:** The following BIOS information will be displayed:

#### System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Key in new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

**SuperMicro X8DAH**

- **Version**: This item displays the BIOS revision used in your system.
- **Build Date**: This item displays the date when this BIOS was completed.

**Processor**

The AMI BIOS will automatically display the status of the processor used in your system:

- **CPU Type**: This item displays the type of CPU used in the motherboard.
- **Speed**: This item displays the speed of the CPU detected by the BIOS.
- **Physical Count**: This item displays the number of processors installed in your system as detected by the BIOS.
- **Logical Count**: This item displays the number of CPU Cores installed in your system as detected by the BIOS.

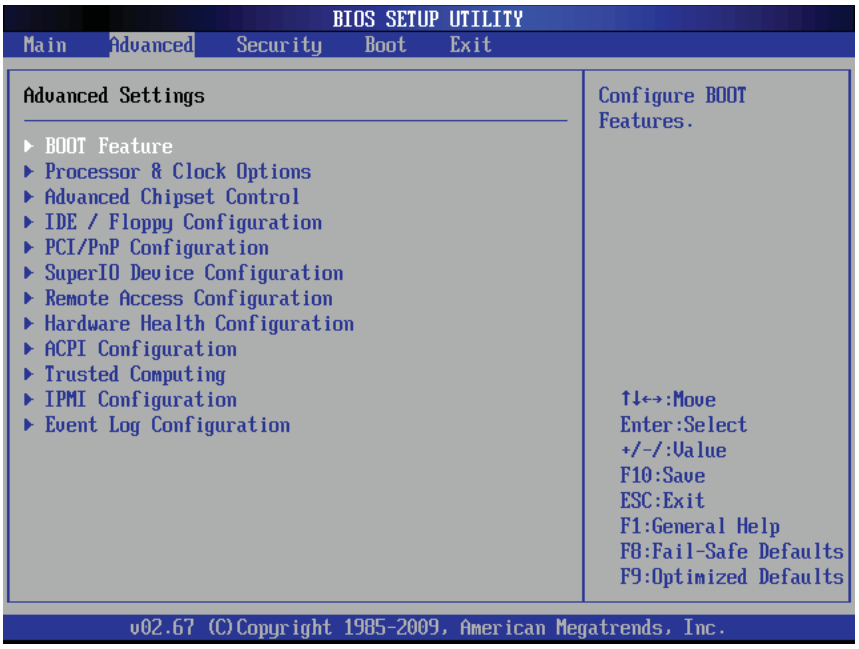
**System Memory**

This displays the size of memory available in the system:

- **Populated Size**: This item displays the installed memory size detected by the BIOS.
- **Available Size**: This item displays the available memory detected by the BIOS.

## 4-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and hit <Enter> to access the submenu items:




### ▶BOOT Features

#### Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

#### Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

#### AddOn ROM Display Mode

This sets the display mode for Option ROM. The options are **Force BIOS** and Keep Current.

#### Bootup Num-Lock

This feature selects the Power-on state for Numlock key. The options are Off and **On**.

#### PS/2 Mouse Support

This feature enables support for the PS/2 mouse. The options are Disabled, Enabled and **Auto.**

**Wait For 'F1' If Error**

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

**Hit 'Del' Message Display**

This feature displays "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

**Watch Dog Function**

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

**Restore on AC Power Loss**

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

**Interrupt 19 Capture**

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are Enabled and **Disabled**.

## ▶Processor and Clock Options

This submenu allows the user to configure the Processor and Clock settings.

**CPU Ratio**

If set to Manual, this option allows the user to set the ratio between the CPU Core Clock and the FSB Frequency. (**Note**: if an invalid ratio is entered, the AMI BIOS will restore the setting to the previous state.) The options are **Auto** and Manual.

**Ratio CMOS Setting**

If CPU Ratio is set to Manual (above), this option allows the user to set the ratio between the CPU Core Clock and the FSB Frequency. (**Note**: if an invalid ratio is entered, the AMI BIOS will restore the setting to the previous state.) The default setting depends on the type of CPU installed on the motherboard. The default setting for the CPU installed in your motherboard is **[21]**. Press "+" or "-" on your keyboard to change this value.

**Clock Spread Spectrum**

Select Enable to use the feature of Clock Spectrum, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

**Hardware Prefetcher (Available when supported by the CPU)**

If set to Enabled, the hardware pre fetcher will pre fetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

**Adjacent Cache Line Prefetch (Available when supported by the CPU)**

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

**Intel® Virtualization Technology (Available when supported by the CPU)**

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and **Disabled**. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

**Execute-Disable Bit Capability (Available when supported by the OS and the CPU)**

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

**Simultaneous Multi-Threading (Available when supported by the CPU)**

Set to Enabled to use the Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

**Active Processor Cores**

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1 and 2.

**Intel® EIST Technology**

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disabled and **Enabled**.

**C1E Support**

Select Enabled to use the feature of Enhanced Halt State. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

**Intel® C-STATE Tech**

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled.**

**C-State package limit setting (Available when Intel® C-State Tech is enabled)**

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

**C1 Auto Demotion**

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled.**

**C3 Auto Demotion**

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled.**

**DCA Technology**

This feature accelerates the performance of TOE devices. **Note**: A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of this add-on card. For this motherboard, the TOE device is built inside the ESB 2 South Bridge chip. This feature is supported only by some types of processors (i.e., Intel Nehalem-WS 1S). The options are **Enabled** and Disabled.

**DCA Prefetch Delay**

A DCA Prefetch is used with TOE components to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching too frequently can saturate the cache directory and delay necessary cache accesses. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120]

## ▶Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below:

## ▶QPI & IMC Configuration

### QPI Links Speed

This feature selects QPI's data transfer speed. The options are Slow-mode, and **Full Speed**.

### QPI Frequency

This selects the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

### QPI L0s and L1

This enables the QPI power state to low power. L0s and L1 are automatically selected by the motherboard. The options are **Disabled** and Enabled.

### Memory Frequency

This feature forces a DDR3 frequency slower than what the system has detected. The available options are **Auto**, Force DDR-800, Force DDR-1066, and Force DDR-1333.

### Memory Mode

The options are **Independent**, Channel Mirror, Lockstep and Sparing.

Independent - All DIMMs are available to the operating system.

Channel Mirror - The motherboard maintains two identical copies of all data in memory for redundancy.

Lockstep - The motherboard uses two areas of memory to run the same set of operations in parallel.

Sparing - A preset threshold of correctable errors is used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory.

### Demand Scrubbing

A memory error-correction scheme where the Processor writes corrected data back into the memory block from where it was read by the Processor. The options are **Enabled** and Disabled.

### Patrol Scrubbing

A memory error-correction scheme that works in the background looking for and correcting resident errors. The options are **Enabled** and Disabled.

**Throttling - Closed Loop / Throttling - Open Loop**

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are **Disabled** and Enabled. If Enabled, the following items will appear:

**Hysteresis Temperature (Closed Loop only)**

Temperature Hysteresis is the temperature lag (in degrees Celsius) after the set DIMM temperature threshold is reached before Closed Loop Throttling begins. The options are **Disabled**, 1.5$^{o}$C, 3.0$^{o}$C, and 6.0$^{o}$C.

**Guardband Temperature (Closed Loop only)**

This is the temperature which applies to the DIMM temperature threshold. Each step is in 0.5$^{o}$C increment. The default is **[006]**. Press "+" or "-" on your keyboard to change this value.

**Inlet Temperature**

This is the temperature detected at the chassis inlet. Each step is in 0.5$^{o}$C increment. The default is **[070]**. Press "+" or "-" on your keyboard to change this value.

**Temperature Rise**

This is the temperature rise to the DIMM thermal zone. Each step is in 0.5$^{o}$C increment. The default is **[020]**. Press "+" or "-" on your keyboard to change this value.

**Air Flow**

This is the air flow speed to the DIMM modules. Each step is one mm/sec. The default is **[1500]**. Press "+" or "-" on your keyboard to change this value.

**Altitude**

This feature defines how many meters above or below sea level the system is located. The options are **Sea Level or Below,** 1~300, 301~600, 601~900, 901~1200, 1201~1500, 1501~1800, 1801~2100, 2101~2400, 2401~2700, 2701~3000.

**DIMM Pitch**

This is the physical space between each DIMM module. Each step is in 1/1000 of an inch. The default is **[400]**. Press "+" or "-" on your keyboard to change this value.

### HDA Controller

Select Enabled to activate the onboard High-Definition Audio controller. The options are **Enabled** and Disabled.

### Intel VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and **Disabled**.

### SR-IOV Support

Single Root I/O Virtualization is an industry-standard mechanism that allow devices to advertise their capability to be simultaneously shared among several virtual machines. SR-IOV is capable of partitioning a PCI function into several virtual interfaces for sharing the resources of a PCI Express (PCIe) device under a virtual environment. The options are **Disabled** and Enabled.

### NUMA Support

Select Enabled to use the feature of Non-Uniform Memory Access to improve CPU performance. The options are Enabled and **Disabled**.

### Intel I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing resources for more other tasks. The options are Disabled and **Enabled**.

### Active State Power Management

Select Enabled to start Active-State Power Management for signal transactions between L0 and L1 Links on the PCI Express Bus. This maximizes power-saving and transaction speed. The options are Enabled and **Disabled**.

## Route Port 80h Cycles to

This feature allows the user to decide which bus to send debug information to. The options are **LPC** and PCI.

### USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled, 2 USB ports, 4 USB ports, 6 USB ports, 8 USB ports, 10 USB ports and **12 USB ports**.

### USB 2.0 Controller

Select Enabled to activate the onboard USB2.0 controller. The options are **Enabled** and Disabled.

### Legacy USB Support

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard, and vise versa. The settings are Disabled, Enabled and **Auto**.

## ▶IDE/Floppy Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE devices and displays the following items:

### Floppy A

This feature allows the user to select the type of floppy drive connected to the system as specified. The options are Disabled, 360KB 5 1/4", 1.2MB 5 1/4", 720KB 3 1/2", 1.44MB 3 1/2" and 2.88MB 3 1/2". The default setting for Floppy A is 1.44MB 3 1/2", and for Floppy B is **Disabled.**

### SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while selecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, Compatible and **Enhanced**.

#### Configure SATA#1 as

This feature allows the user to select the drive type for SATA#1. The options are **IDE,** RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear.)

#### ICH RAID Code Base (This feature is available when the option-RAID is selected)

Select Intel to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to enable Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are **Intel** and Adaptec.

#### SATA#2 Configuration (This feature is available when the option-IDE is selected)

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled, and **Enhanced**.

### IDE Detect Timeout (sec)

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

### Primary IDE Master/Slave, Secondary IDE Master/Slave, Third IDE Master, and Fourth IDE Master

These settings allow the user to set the parameters of Primary IDE Master/Slave, Secondary IDE Master/Slave, Third and Fourth IDE Master slots. Hit <Enter> to activate the following submenu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the submenu are:

#### Type

Select the type of device connected to the system. The options are Not Installed, **Auto**, CD/DVD and ARMD.

#### LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

#### Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

#### PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4.

Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 to allow the AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs.

Select 1 to allow the AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs.

Select 2 to allow the AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs.

Select 3 to allow the AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs.

Select 4 to allow the AMI BIOS to use PIO mode 4. It has a data transfer bandwidth of 32-Bits. Select Enabled to enable 32-Bit data transfer.

**DMA Mode**

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE disk drive support cannot be determined.

Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MBs.

Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MBs.

Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MBs.

Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MBs.

Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MBs.

Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2. It has a data transfer rate of 16.6 MBs.

Select UDMA0 to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6 MBs. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2.

Select UDMA1 to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MBs.

Select UDMA2 to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MBs.

Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 66.6 MBs.

Select UDMA4 to allow the BIOS to use Ultra DMA mode 4. It has a data transfer rate of 100 MBs.

Select UDMA5 to allow the BIOS to use Ultra DMA mode 5. It has a data transfer rate of 133 MBs.

Select UDMA6 to allow the BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133 MBs. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

**S.M.A.R.T. For Hard disk drives**

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect hard disk drive support. Select Disabled to prevent the AMI BIOS from using the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

**32Bit Data Transfer**

Select Enable to enable the function of 32-bit IDE data transfer. The options are **Enabled** and Disabled.

## ▶PCI/PnP Configuration

**Clear NVRAM**

This feature clears the NVRAM during system boot. The options are **No** and Yes.

**Plug & Play OS**

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

**PCI Latency Timer**

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

**PCI IDE BusMaster**

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and **Enabled.**

**PCIe I/O Performance**

This feature sets the PCIE maximum payload size. The options are **128B** and 256B.

**PCI-E Slot 1 x8, PCI-E Slot 2 x16, PCI-E Slot 3 x8, PCI-E Slot 4 x8 (in x16 slot), PCI-E Slot 5 PCI-E x4 (in x8 slot), PCI-E Slot 6 x16, PCI-E Slot 7 x8.**

This feature allows you to Enable or Disable any of the PCI slots. The options are **Enable** and Disable.

**Onboard LAN Option ROM Select**

Select the onboard LAN option ROM type. The options are iSCSI and **PXE**.

**Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM**

Select Enabled to enable the onboard LAN1 or LAN2 Option ROM. This is to boot computer using a network interface. The options are Enabled and **Disabled.**

**Boot Graphics Adapter Priority**

This feature allows the user to select the priority graphics adapter for system boot. The options are Auto and **Onboard VGA.**

## ▶Super IO Device Configuration

**Serial Port1 Address / Serial Port2 Address**

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, and 2E8/IRQ3.

**Serial Port2 Mode**

This feature allows the user to set the mode for Serial Port B. The options are **Normal**, IR (Infra-Red) and ASK-IR.

**Onboard Floppy Controller**

Select Enabled to enable the onboard floppy controller. The options are Disabled and **Enabled**.

## ▶Remote Access Configuration

**Remote Access**

This allows the user to enable the Remote Access feature. The options are **Disabled** and Enabled.

If Remote Access is set to Enabled, the following items will display:

**Serial Port Number**

This feature allows the user decide which serial port to be used for Console Redirection. The options are **COM 1** and COM 2.

**Base Address, IRQ**

This item displays the based address and IRQ of the serial port specified above.

### Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

### Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

### Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and Boot Loader. The options are Disabled, Boot Loader, and **Always**.

### Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are ANSI, **VT100**, and VT-UTF8.

### VT-UTF8 Combo Key Support

A terminal keyboard definition that provides a way to send commands from a remote console. Available options are **Enabled** and Disabled.

### Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay,** Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

## ▶Hardware Health Monitor

This feature allows the user to monitor system health and review the status of each item as displayed.

### CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

**Warning!** 1.Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.

2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

**CPU Temperature/System Temperature**

This feature displays current temperature readings for the CPU and the System.

The following items will be displayed for your reference only:

**CPU Temperature**

The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

**Low** – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

User intervention: No action required.

**Medium** – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

**High** – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm. The system may shut down if it continues for a long period to prevent damage to the CPU.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

**Notes**:

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the motherboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25$^{o}$C).

The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

**System Temperature:** The system temperature will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

### Fan Speed Readings

This feature displays the fan speed readings from Fan1 through Fan8.

### Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select Disabled to disable the fan speed control function and allow the onboard fans to constantly run at full speed. The Options are: **Full Speed**, Server, Workstation/Desktop, and Server Quiet.

### Voltage Readings

The following voltage readings will be displayed.

CPU0 Vcore, CPU1 Vcore, 1.5V, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt

## ▶ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

### High Performance Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

### USB Device Wakeup

Select Enable to "wake-up" the system via a USB device when the system is in S3 or S4 State. The options are Enabled and **Disabled**.

### PS2 KB/MS Wake Up

Select Enable to "wake-up" the system using either the PS2 keyboard or mouse (if equipped) when the system is in S3 (Sleep) or S4 (Hibernate) state. The options are Enabled and **Disabled**.

### ACPI Aware O/S

Enable ACPI support if it is supported by the OS to control ACPI through the Operating System. Otherwise, disable this feature. The options are **Yes** and No.

### Suspend Mode

This option is used to select the ACPI State that is used for system suspend. The options are **S1 (POS)**, S3 (STR) and Auto.

S1 (POS) - All processor caches are erased, and stops executing instructions. Power to the CPU(s) and RAM is maintained, but RAM is refreshed.

S3 (STR) - The CPU has no power and the power supply goes on reduced power mode. However, main memory (RAM) is still powered.

### ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are **Enabled** and Disabled.

### APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

### Headless Mode

This feature is used to enable system to function without a keyboard, monitor and/or mouse attached The options are Enabled and **Disabled**.

### ACPI Version Features

The options are ACPI v1.0, **ACPI v2.0** and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/.

## ▶Trusted Computing

### TCG/TPM (Trusted Platform Module) Support

Select Yes on this item and enable the TPM jumper on the motherboard to enable TCG (TPM 1.1/1.2)/TPM support in order to improve data integrity and network security. The options are **No** and Yes. If this feature is set to Yes, the following items will display:

#### Indicate Physical

Enables indication of physical presence to TPM device each time the system starts. The options are Yes and **No**.

#### TPM Deactivated

Use this feature to Set or Clear the TPM device. The options are Set, Clear and **Don't Change**.

#### TPM Owner

Use this feature to Install or Clear the TPM ownership. The options are **Don't Change**, Enable Install, Disable Install and Clear.

#### Execute TPM Command

Select Enabled to allow the user to change executable TPM commands and TPM settings. Select Don't Change to keep the current TPM settings. The options are **Don't Change**, Enabled, and Disabled.

##### TPM Enable/Disable Status

This item displays the status of TPM Enabled/Disabled state.

##### TPM Owner Status

This item displays the status of TPM Ownership.

## ▶IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole. For more information on the IPMI specifications, please visit Intel's website at www.intel.com.

### IPMI Firmware Revision

This item displays the current IPMI firmware revision.

### Status of BMC

Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This is an informational feature which returns the status code of the BMC micro controller.

## ▶View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. To view an event, select an Entry Number and pressing <Enter> to display the information as shown in the screen.

- Total Number of Entries
- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Timestamp, Generator ID
- Event Message Format User
- Event Sensor Type
- Event Sensor Number,
- Event Dir Type
- Event Data.

### Clear BMC System Event Log

Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

⚠ **Caution**: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

## ▶Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.

**Channel Number** - Enter the channel number for the SET LAN Config command. This is initially set to **[01]**. Press "+" or "-" on your keyboard to change the Channel Number.

**Channel Number Status** - This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

### IP Address Source

Select the source of this machine's IP address. If Static is selected, you will need to know and enter manually the IP address of this machine below. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network it is attached to, and request the next available IP address. The options are **DHCP** and Static.

The following items are assigned IP addresses automatically if DHCP is selected under IP Address Source above:

#### IP Address

Enter the IP address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255 as shown in the screen below.

#### Subnet Mask

Subnet masks tell the network which subnet this machine belongs to. The value of each three-digit number separated by dots should not exceed 255.

#### Gateway Address

This is the IP address of the gateway in the network. This is usually a router.

### Mac Address

The BIOS will automatically enter the Mac address of this machine; however it may be over-ridden. Mac addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

## ▶SET PEF Configuration

### PEF Support

Select Enabled to enable the function of Platform Event Filter (PEF) which will interpret BMC events and perform actions based on pre-determined settings or events and performs actions based on pre-determined settings or 'traps' under IPMI 1.5

specifications. For example, powering the system down or sending an alert when a triggering event is detected. The default is **Disabled.**

The following will appear if PEF Support is set to Enabled.

**PEF Action Global Control (Available if the item-PEF Support is enabled)**

These are the different actions based on BMC events. The options are **Alert**, Power Down, Reset System, Power Cycle, OEM Action, Diagnostic Interface.

**Alert Startup Delay (Available if the item-PEF Support is enabled)**

This feature inserts a delay during startup for PEF alerts. The options are Enabled and **Disabled**.

**Startup Delay (Available if the item-PEF Support is enabled)**

This feature enables or disables startup delay. The options are Enabled and **Disabled**.

**Event Message for PEF Action (Available if the item-PEF Support is enabled)**

This enables of disables Event Messages for PEF action. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at www.intel.com. The options are **Disabled** and Enabled.

**BMC Watch Dog Timer Action**

Allows the BMC to reset or power down the system if the operating system hangs or crashes. The options are **Disabled**, Reset System, Power Down, Power Cycle.

**BMC Watch Dog TimeOut [Min:Sec]**

This option appears if BMC Watch Dog Timer Action (above) is enabled. This is a timed delay in minutes or seconds, before a system power down or reset after an operating system failure is detected. The options are **[5 Min]**, [1 Min], [30 Sec], and [10 Sec].

## ▶Event Log Configuration

**View Event Log**

Use this option to view the System Event Log.

**Mark all events as read**

This option marks all events as read. The options are OK and Cancel.

### Clear event log

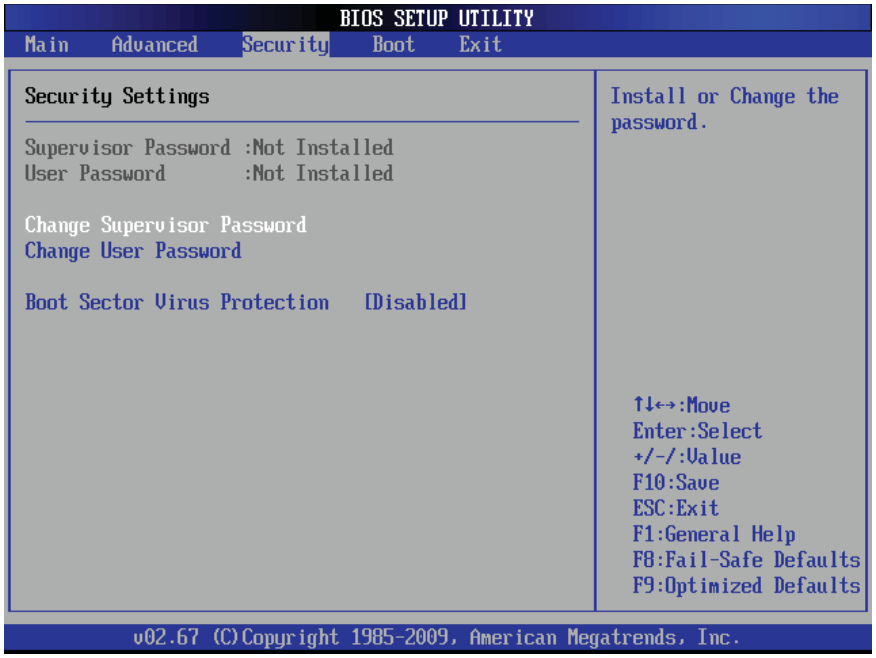
This option clears the Event Log memory of all messages. The options are OK and **Cancel.**

### PCI Error Log

Use this option to enable PCI error (PERR) logging. The options are **Yes** and No.

## 4-4 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.




### Supervisor Password

This item indicates if a Supervisor password has been entered for the system. "Not Installed" means a Supervisor password has not been used.

### User Password

This item indicates if a user password has been entered for the system. "Not Installed" means that a user password has not been used.

### Change Supervisor Password

Select this feature and press <Enter> to access the submenu, and then type in a new Supervisor Password.

**User Access Level** (Available when Supervisor Password is set as above)

Available options are **Full Access**: grants full User read and write access to the Setup Utility, View Only: allows access to the Setup Utility but the fields cannot be

changed, Limited: allows only limited fields to be changed such as Date and Time, No Access: prevents User access to the Setup Utility.

**Change User Password (Available when a User Password is installed)**

Select this feature and press <Enter> to access the submenu , and then type in a new User Password.

**Clear User Password (Available only when User Password is installed)**

This item allows you to clear a user password after it has been entered.

**Password Check (Available when a password is installed)**

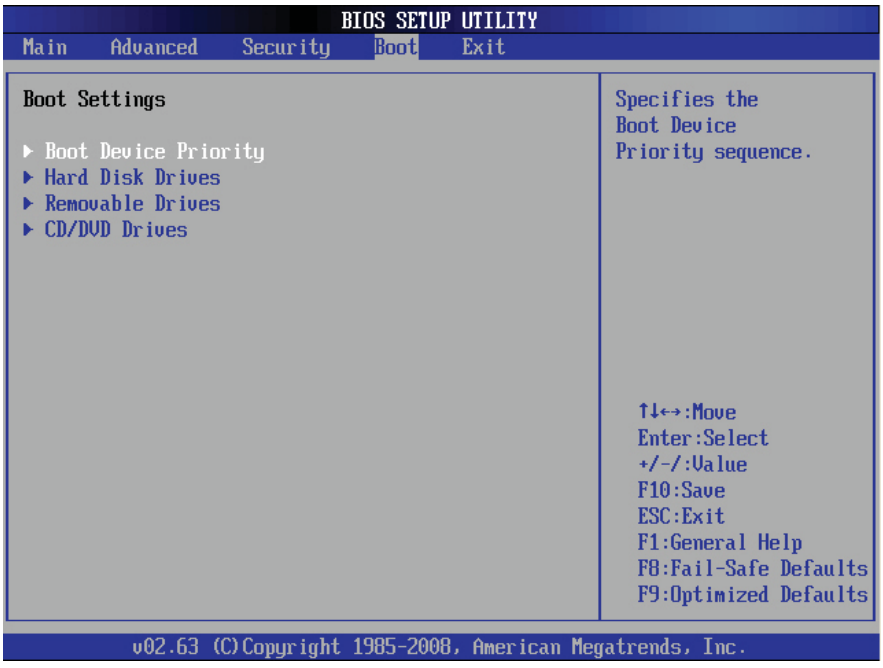
This item forces the system to prompt for a password only when entering BIOS setup or during each bootup. The options are **Setup** and Always.

**Boot Sector Virus Protection**

When Enabled, the AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

## 4-5 Boot Configuration

Use this feature to configure boot settings.



## ▶Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are 1st boot device, 2nd boot device, 3rd boot device, 4th boot device, 5th boot device and Disabled.

- 1st Boot Device - [USB: XXXXXXXXX]
- 2nd Boot Device - [CD/DVD: XXXXXXXXX]

## ▶Hard Disk Drives

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all hard disk drives that have been detected (i.e., 1st Drive, 2nd Drive, 3rd Drive, etc).

- 1st Drive - [SATA: XXXXXXXXX]

## ▶Removable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

- 1st Drive - [USB: XXXXXXXXX]
- 2nd Drive

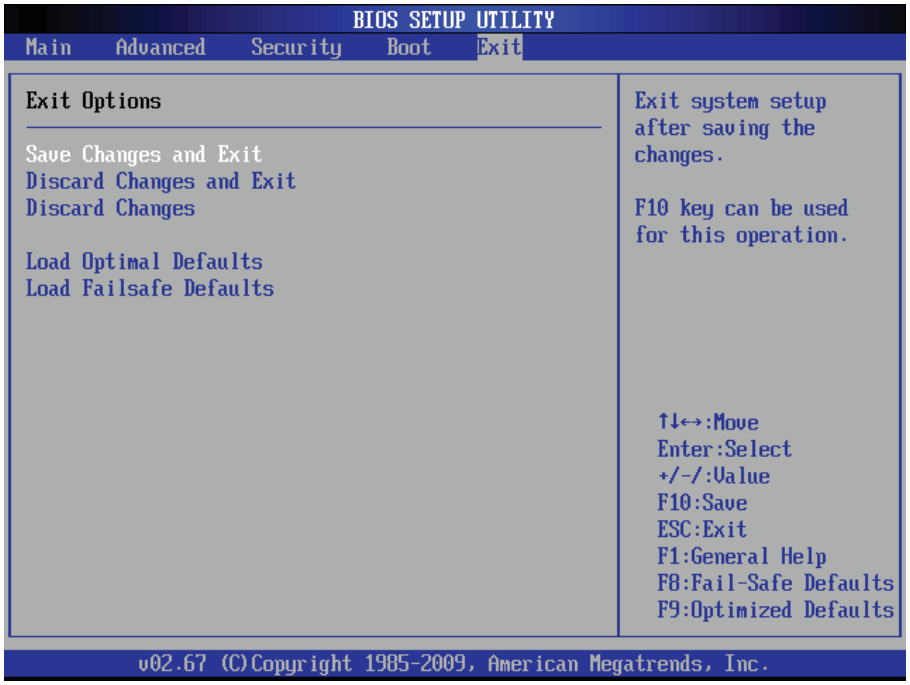
## ▶CD/DVD Drives

This feature allows the user to specify the boot sequence from available CD/DVD Drives (i.e., 1st Drive, 2nd Drive, etc).4-6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.

## 4-6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.




### Save Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

### Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

### Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

### Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

### Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

## 4-7 BIOS Recovery

**Warning!** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you need to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

### How to Recover the AMIBIOS Image (-the Main BIOS Block)

An AMIBIOS flash chip consists of a boot sector block, and a main BIOS code block (a main BIOS image). The boot sector block contains critical BIOS code, including memory detection and recovery code to be used to flash a new BIOS image if the original BIOS Image is corrupted. When the system is powered on, the boot sector code executes first. Once it is completed, the main BIOS code will continue with system initialization and complete the bootup process.

**Notes:** BIOS Recovery described below is used when the main BIOS block crashes. However, when the BIOS Boot sector crashes, you will need to send the motherboard back to Supermicro for RMA repairs.

### 4.7.1 Boot Sector Recovery from a USB Device

This feature allows the user to recover a BIOS image using a USB device without additional utilities needed. A user can download the BIOS image into a USB flash device, and name the file "SUPER.ROM" for the recovery process to load the file. A USB flash device such as a USB Flash Drive, a USB CDROM or a USB CDRW device can be used for this purpose,

1. Insert the USB device that contains the new BIOS image (the ROM files) saved in a root directory into your USB drive.

2. While turning the power on, press and hold <Ctrl> and <Home> at the same time until the USB Access LED Indicator comes on. This might take a few seconds.

3. Once the USB drive LED is on, release the <Ctrl> and <Home> keys. AMIBIOS will issue beep codes to indicate that the BIOS ROM file is being updated.

4. When BIOS flashing is completed, the computer will reboot. Do not interrupt the flashing process until it is completed.

### 4.7.2 Boot Sector Recovery from an IDE CD-ROM

This process is almost identical to the process of Boot Sector Recovery from a USB device, except that the BIOS image file is loaded from a CD-ROM. Use a CD-R or CD-RW drive to burn a CD with the BIOS image file in it, and name the file "SUPER.ROM" for the recovery process to load the file.

### 4.7.3 Boot Sector Recovery from a Serial Port ("Serial Flash")

This process, also known as "Serial Flash," allows the user to use a serial port to load a BIOS image for Boot Sector recovery. This feature is usually used for embedded systems that rely on a serial port for remote access and debugging.

#### *Requirements*

In order to use Serial Flash for Boot Sector Recovery, you will need to meet the following requirements.

- The "Target system," the system that needs BIOS updates, must have a serial port and "Serial Flash" support embedded in the BIOS image file.
- The "Host system" should also have a serial port and a terminal program that supports XModem Transfer protocol (Hyper Terminal for the Windows operating systems, and minicom for Linux/FreeSBD, etc.).
- A Null_modem serial cable

#### *How to use Serial Flash for Boot Sector Recovery*

1. Connect a Null_modem serial cable between the target system and the host system that runs the terminal program.

2. Make sure that the new BIOS Image file is accessible for the host system.

3. Start the terminal program on the host system and create a new connection. Use the following communication parameters for the new connection.

    - Bits per second: 115200 bits/sec.
    - Data Bits: 8
    - Parity: None
    - Stop Bit: 1
    - Flow Control: None

4. Power on your system and click the <Connect> button in the Hyper Terminal. The terminal screen will display the following messages.

```
Press <SpaceBar> to update BIOS.
Confirm update BIOS? (y/n) y
Begin remote BIOS flash? (y/n) y
Starting remote flash.
Upload new BIOS file using Xmodem protocol.
```

5. Following the instructions given on the screen to update the BIOS. These instructions are also shown below.

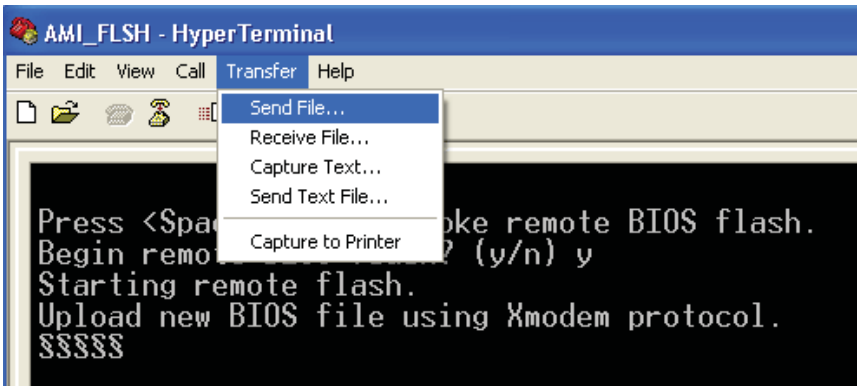
   a. At the prompt, press the <SpaceBar> to update the BIOS.
   b. When asked to confirm BIOS updating, press <y> to confirm BIOS updates.
   c. Press <y> again to begin flashing BIOS remotely.

   **Note**: Be sure to complete Steps a~c above quickly because you have a second or less to do so.

6. Once you've completed the instructions given, a screen will display to indicate that remote flashing is starting and the new BIOS file is being uploaded.

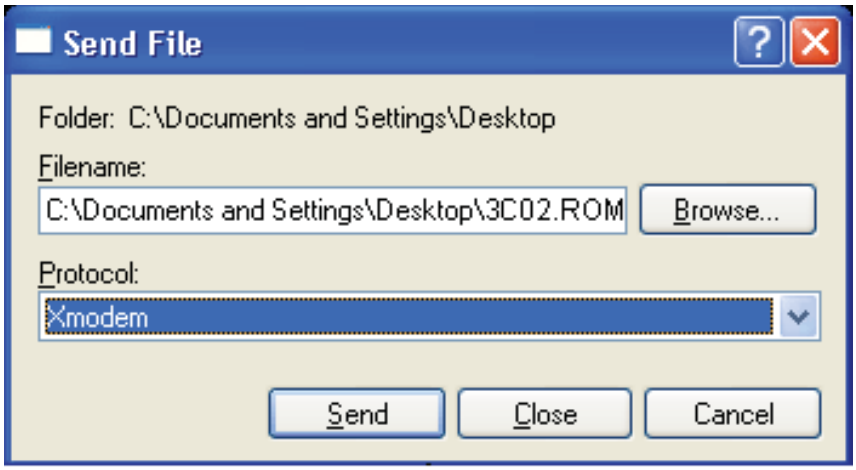
7. To use Hyper Terminal to transfer the XModem protocol by using the "Send File" dialog under the "Transfer" menu, follow the instructions below to complete XModem transfers.

   a. Select the "Transfer" menu and enter <Send>.




   b. Specify the location of the ROM file and select the proper protocol (XModem).

   c. Press <Send> to start ROM File extraction. (See the picture below.)




d. Once the ROM file extraction is completed, the message: "New BIOS received OK" will display.

```
Starting FLASH Recovery.
NVRAM data will be destroyed.
CMOS data will be preserved.
.....................................................
.....................................
Ending FLASH Recovery.
FLASH Update completed successfully.
Rebooting...
```

8. Once remote BIOS flash is completed, the system will reboot.

**Note:** AMIBIOS Serial Flash will work with any terminal communications program that supports VT-100 and XModem protocols, including protocols designed for GNU/LINUX & BSD operating systems such as minicom. It is recommended that the terminal program be configured to use the 'CR/LF' style of line termination.

# Appendix A

# BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

**Non-fatal errors** are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

**Fatal errors** will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

## A-1 BIOS Error Beep Codes

| BIOS Error Beep Codes | | |
|---|---|---|
| **Beep Code** | **Error Message** | **Description** |
| 1 beep | Refresh | Circuits have been reset. (Ready to power up) |
| 5 short beeps + 1 long beep | Memory error | No memory detected in the system |
| 8 beeps | Display memory read/write error | Video adapter missing or with faulty memory |
| Continuous High (pitch) + Low (pitch) (siren-like) | System Overheat | System Overheat |

# Notes

# Appendix B

# Installing the Windows OS

After all hardware components have been installed, you must first configure Intel South Bridge RAID Settings before you install the Windows OS and other software drivers. To configure RAID settings, please refer to RAID Configuration User Guides posted on our website at www.supermicro.com/support/manuals.

## B-1 Installing the Windows OS to a RAID System

1. Insert Microsoft's Windows XP/2003/2008/Vista Setup CD in the CD Driver, and the system will start booting up from CD.

2. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.

3. When the Windows OS Setup screen appears, press "S" to specify additional device(s).

4. Insert the driver diskette-"ITE RAID Windows XP/2003/2008/Vista Driver for IDE" into Drive A: and press the <Enter> key.

5. When the Windows OS Setup screen appears, press "S" to specify additional device(s).

6. Insert the driver diskette-"Intel AA Windows XP/2003/2008/Vista Driver for ICH10R" into Drive A: and press the <Enter> key.

7. Choose the Intel(R) ICH10R *SATA RAID Controller* from the list indicated in the Windows OS Setup Screen, and press the <Enter> key.

8. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

9. From the Windows OS Setup screen, press the <Enter> key. The Windows OS Setup will automatically load all device files and then, continue the Windows OS installation.

10. After the Windows OS Installation is completed, the system will automatically reboot.

## B-2 Installing the Windows OS to a Non-RAID System

1. Insert Microsoft's Windows XP/Windows 2003/Windows 2008/Windows Vista Setup CD in the CD Driver, and the system will start booting up from CD.

2. Continue with the OS installation. The Windows OS Setup screen will display.

3. From the Windows OS Setup screen, press the <Enter> key. The Windows OS Setup will automatically load all device files and then continue with the Windows OS installation.

4. After the Windows OS Installation is completed, the system will automatically reboot.

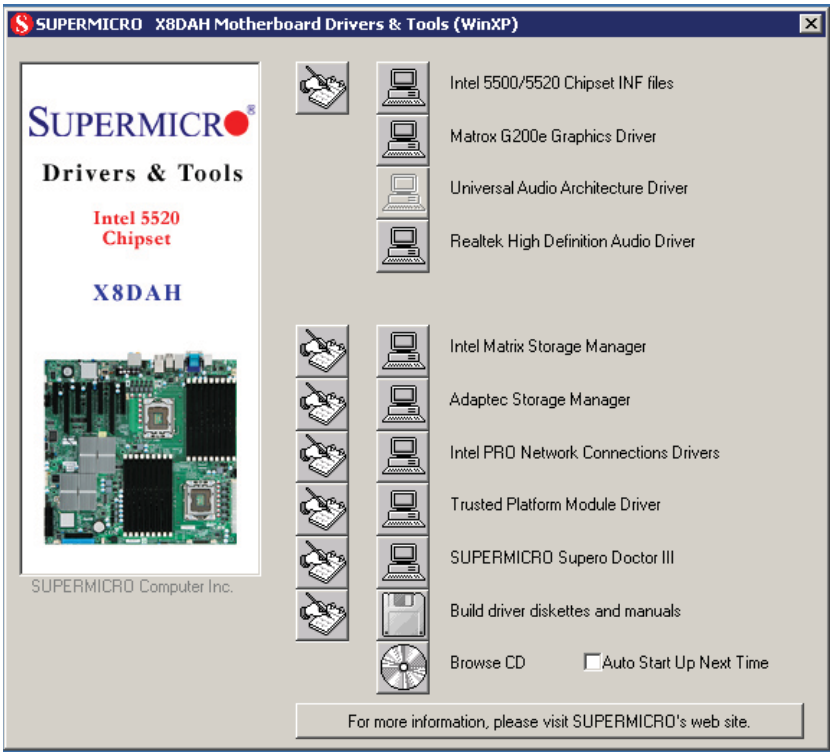
5. Insert the Supermicro Setup CD that came with your motherboard into the CD Drive during system boot, and the main screen will display.

# Appendix C

# Software Installation Instructions

## C-1 Installing Software Programs

After you've installed the Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items.




**Driver/Tool Installation Display Screen**

**Notes**:

1. Click the icons showing a hand writing on the paper to view the readme files for each item. Click on a computer icon to the right of an item to install an item (from top to the bottom) one at a time. After installing each item, you must reboot the system before proceeding with the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.

2. When making a storage driver diskette by booting into a Driver CD, please set the SATA Configuration to "Compatible Mode" and configure SATA as IDE in the BIOS Setup. After making the driver diskette, be sure to change the SATA settings back to your original settings.

## C-2 Configuring Supero Doctor III

The Supero Doctor III program is a Web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called the SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

**Note**: 1 The default user name and password are ADMIN.

**Note 2:** In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in BIOS.

**Supero Doctor III Interface Display Screen-I (Health Information)**

**Supero Doctor III Interface Display Screen-II (Remote Control)**

Super Doctor III
Remote Management
SUPERMICRO
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.
Power control

**Note**: SD III Software Revision 1.0 can be downloaded from our Web-site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend that you use Supero Doctor II.

## Notes

(Disclaimer Continued)

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